S.153.

S.153.A

LINCOLNSHIRE

NATURALISTS' UNION.

TRANSACTIONS, 1935—1938.

BRITISH MUSEUM
NATURAL HISTORY

VOLUME NINE.

EDITED BY F. T. BAKER, F.R.E.S., & A. ROEBUCK, N.D.A., F.R.E.S.

PRESENTED
9 JUN 1937

Lincolnshire Naturalists' Union Transactions.

1936

Edited by
F. T. BAKER,
F.R.E.S.,
AND
A. ROEBUCK,
N.D.A., F.R.E.S.

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Lincolnshire Naturalists' Union.

Founded June 12th, 1893.

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STATEMENT OF ACCOUNT from January 1st to December 31st, 1936.

GENERAL FUND.

RECEIPTS.	£	s.	d.
Balance in Bank, 1st January 1936	22	9	8
Members' Subscriptions	43	12	6
Bank Interest	0	6	6
	£66	8	8

PAYMENTS.	£	s.	d.
Printer's Account for Notices of Meetings, Stationery, etc.	4	16	2
Postages and small payments	10	4	7
Binding 8 vols. Transactions	1	0	8
Grant to Publication Fund	41	5	0
Balance in Bank, 31st December 1936... ...	9	2	3
	£66	8	8

PUBLICATION FUND.

	£	s.	d.
Donations to Publication Fund...	1	16	9
Sale of Transactions	2	9	3
Donation from Mr. J. F. Musham to cost of blocks of Duck Decoy	2	13	6
Grant from General Fund	41	5	0
	£48	4	6

	£	s.	d.
Printer's Account for "Transactions" ...	42	10	0
Blocks and printing of Plates	5	14	6
	£48	4	6

SEPARATE ACCOUNT.

Life Members' Subscriptions invested in P.O. Savings Bank.

	£	s.	d.
Amount shown on Balance Sheet for 1935	90	1	5
Interest for the year 1935	2	5	0
Additional Life Members' Subscriptions	10	0	0
	£102	6	5

BRITISH MUSEUM

ARTHUR SMITH, F.L.S., F.R.E.S.

Hon. Secretary 1904-1933

PRESIDENT 1934.

The Twenty-ninth President
OF THE
Lincolnshire Naturalists' Union.

ARTHUR SMITH, F.L.S.

The interests of later life are often almost born with us; it was so with Mr. Arthur Smith. His inclinations towards Natural History began with his early schooldays. Later, on coming into contact with that veteran Grimsby entomologist, Mr. C. K. Tero, his interests were fostered and developed. In 1886 a Naturalists' Society was formed in Grimsby and he was keenly interested but, being under the age-limit of 18, he was unable to become a member. Admitted a year later, he soon became an officer and sub-curator of its collections. This society was short-lived, but a few years later Mr. Smith helped to found the Grimsby and District Antiquarian and Naturalists' Society that still meets regularly.

It was about 1905 that I first made the acquaintance of Arthur Smith. I had just settled in practise in Grimsby when I received a call from Dr. Wallace, who had heard that I was interested in field botany; he invited me to join the Grimsby society, which I did. Mr. Smith was secretary of the Society and curator of its museum. It was hoped that this museum would form the nucleus of a more pretentious municipal museum and it was always a disappointment to Mr. Smith that Grimsby did not adopt the Museums Act and develop on these lines. Later, Lincoln, with more fore-sight and greater public spirit, robbed Grimsby of its curator.

It is pleasant to look back on the informal meetings in that little room where budding, as well as fully developed naturalists, brought their specimens for discussion and elucidation. But the cement which held the structure together was the genial and erudite curator and secretary. He had always

something helpful to say. I think it was Huxley who defined a liberal education as "something of everything and everything of something". If he were right then Arthur Smith possessed it.

During the summer months Mr. Smith arranged numerous field meetings in the Grimsby district and I still have in my mind's eye that sturdy figure, armed with vasculum and net, trudging through the rushes of Freshney Bog or over the lavender-clad flats of the Cleethorpes foreshore.

While at Grimsby Mr. Smith was teacher of Botany at the Wintringham Secondary School. He was elected a fellow of the Linnean Society in 1902 and a fellow of the Entomological Society prior to this.

In 1904 Mr. Smith was appointed Hon. Secretary of the Lincolnshire Naturalists' Union, which office he held for thirty years. During the whole of this time he was the heart and soul of the Union, and under his guiding hand great strides were made in the investigation of the natural history of this County. In 1905 he edited the first part of our *Transactions*, which publication has since appeared annually and records the work done by the Union. To this and other journals, Mr. Smith contributed many articles. *The Marine Shells of the Lincolnshire Coast*, *Lincolnshire Crustacea*, *Fishes of Lincolnshire*, *Lincolnshire Spiders*, and *Mammalia of Lincolnshire* are a few of his contributions in these pages and in *The Naturalist*.

It was in 1906 that the City and County Museum at Lincoln was commenced and the Lincoln Corporation appointed Mr. Smith as its first Curator. The same enthusiasm was carried into the development of this institution. He secured the transfer of the valuable collections of the Union to form the nucleus of the Natural History section. It was now necessary that he should give considerable attention to antiquities and, though still keeping a keen interest in natural history, the study of things historical had to be taken along with it. His work at the Museum received recognition by the members of the Museums Association who appointed Mr. Smith on several occasions to the Council and in 1922 to the Vice-Presidency. He was among the first to receive its Diploma.

It was with regret that we learned in 1934 of Mr. Smith's intention on retiring to leave Lincolnshire, but the work he accomplished in the County will always be a worthy tribute to him.

G. A. G.

Lincolnshire Naturalists' Union.

Presidential Address

Delivered at Lincoln, November 21st, 1936,

BY

Professor H. H. SWINNERTON, D.Sc., F.G.S., F.Z.S.

THE PHYSICAL HISTORY OF EAST LINCOLNSHIRE

East Lincolnshire is a well defined geographical unit, bounded on three margins by sea and, on its landward side, by the prominent scarp face of the Wolds. Situated as it is between the Humber and the Wash, with the adjoining fenlands, it lies far from the main highways of the country in a position of relative isolation. It is largely on this account that, though it is rich in mineral wealth, it still remains a purely agricultural area.

East Lincolnshire contains two clearly defined natural regions, the Wolds, and the Marshland. The former is a plateau from three to four hundred feet high occupying two thirds of the whole area. This plateau is dissected by numerous valleys the largest of which opens on to the fen country at the southern end of the Wolds. This valley is frequently referred to as the Somersby Valley, after the village in which Lord Tennyson was born. Along it flows "Tennyson's Brook", the river Lymn. No one who has spent any time in the Wolds will continue to think of Lincolnshire as flat or lacking in beauty.

On their eastern margin the Wolds drop rapidly down to the very low-lying land of the Marsh country, most of which

is less than twenty-five feet above sea level. The inland portion of this country is known frequently as the Middle Marsh. This rises to a height of fifty feet above sea level, and has a gently undulating surface beautified with trees and hedgerows. Its seaward portion, the Bottom or Outer Marsh, really merits the description, flat, and is characterised by the absence of trees, and by the presence of drains and dykes instead of hedgerows. Along the coast there is a narrow strip of sand-hills and beach which, owing to the growth of the holiday habit, looms larger in the eyes of the average Midlanders than does the whole county.

The physical history of East Lincolnshire is recorded partly in the surface forms of the land—the hills, valleys and plains—and partly in the rocks out of which these have been carved. It is a long story, lasting through many millions of years, during which this part of England was repeatedly submerged in the sea and uplifted to form land. At those times when it was covered by the sea there were laid down over our area thick accumulations of sediments which, when uplift took place, were converted into rock and exposed to the carving action of rain and frost, rivers and streams.

TABLE OF DEPOSITS IN EAST LINCOLNSHIRE.

Post Glacial		Marine Silts Upper Peat, and Salt Works Fresh-water Marsh Clay Salt Marsh Clay Lower Peat Submerged forest
Pleistocene		Gap Boulder Clay
Tertiary		Very Large Gap
Cretaceous	*Upper*	White Chalk Red Chalk
	Lower	Carstone Sands Tealby Clay Spilsby Sandstone
		Large Gap
Jurassic		Kimeridge Clay

The oldest of the rocks in this area is known to Geologists as the Kimeridge Clay. Though to-day it is to be seen only on the lower slopes of the western scarp and along the floor of the Somersby valley, at that far distant date when our story opens it formed the whole of the land surface of this area. In due time this surface became tilted towards the south where it was flooded anew by the sea. Into the sea flowed rivers carrying the sand and clay which subsequently formed the Lower Cretaceous rocks. Eventually the sea spread over the whole of the area, and far beyond it, until the greater part of England was submerged This state of affairs lasted so long that this part of England became covered by a deposit of chalk at least 360 feet thick. Though the colour of this rock is usually white, the bottom twenty feet are bright red and may be seen to-day forming crimson splashes across the ploughed fields and on the steep hill sides.

Following the formation of the Chalk, movements of the Earth's crust were reversed, with the result that the sea-floor gradually rose and the marine waters flowed from off the British region, leaving it as a dry land whose surface, in the opinion of many, was almost completely covered by chalk. The movement was not a simple uniform uplift for this chalky blanket was at the same time gently folded, and given a tilt from west to east. As soon as the chalky seafloor began to appear above the water rain fell upon its surface, and numerous rivers and streams flowed down from the higher grounds of the Pennine region. As they flowed eastwards these streams joined forces to form larger rivers which lengthened out as the sea retired. Aided by rain and frost these rivers carved broad valleys out of the chalk. Relics of at least two of these are still preserved in the Humber and the Wash. At the same time the chalky cover of the South Pennines and the East Midlands was gradually removed, thus bringing to light the older rocks which make up Derbyshire, Nottinghamshire

and West Lincolnshire. When at last this process of removal affected East Lincolnshire the Lower Cretaceous sandstones and clays were also brought to view, with the result that to-day they occupy much of the countryside around Spilsby and along the Somersby valley. A narrow belt also crops out along the face of the western scarp.

It requires no effort of the imagination to realise that all this erosion and removal of rocks must have taken a very long time, probably the greater part of the Tertiary period. About the middle of that period great mountain building movements took place in many parts of the world. But the earth pressures, which crumpled the rocks elsewhere into mountain systems, affected East Lincolnshire only slightly producing a few gentle upfolds and downfolds, whose axes ran approximately north and south. Anyone who will take the trouble to peep into the numerous chalk pits which are dotted about the Wolds, and observe the direction in which the rocks are dipping, will soon discover that sometimes they dip east and sometimes west as the result of this folding.

The folds just referred to have left no mark upon the surface of the plateau as it is seen to-day. Once the traveller has climbed the steep scarp edge of the Wolds he finds, lying all round him, a landscape that undulates so gently that as he gazes into the distance he can only describe it as flat. Though the layers of chalk below the surface are folded the surface itself has been planed across the folds. When and how did this come about? The mere fact that the surface cuts across the dip of the rocks, and bevels the edges of their layers, shows that the planing agencies worked upon it after the folding had taken place. It must therefore be assumed that this surface was produced during the last division of Tertiary time which is known to the geologist as the Pliocene period.

How was this surface planed? No doubt the major portion of the work was done by rivers and streams acting together with rain and frost for a very long time. During this period the relative levels of sea and land remained practically constant. The rivers excavated their beds almost to sea level

DIAGRAMMATIC SECTIONS ACROSS LINCOLNSHIRE AT SUCCESSIVE PERIODS DURING TERTIARY TIMES.

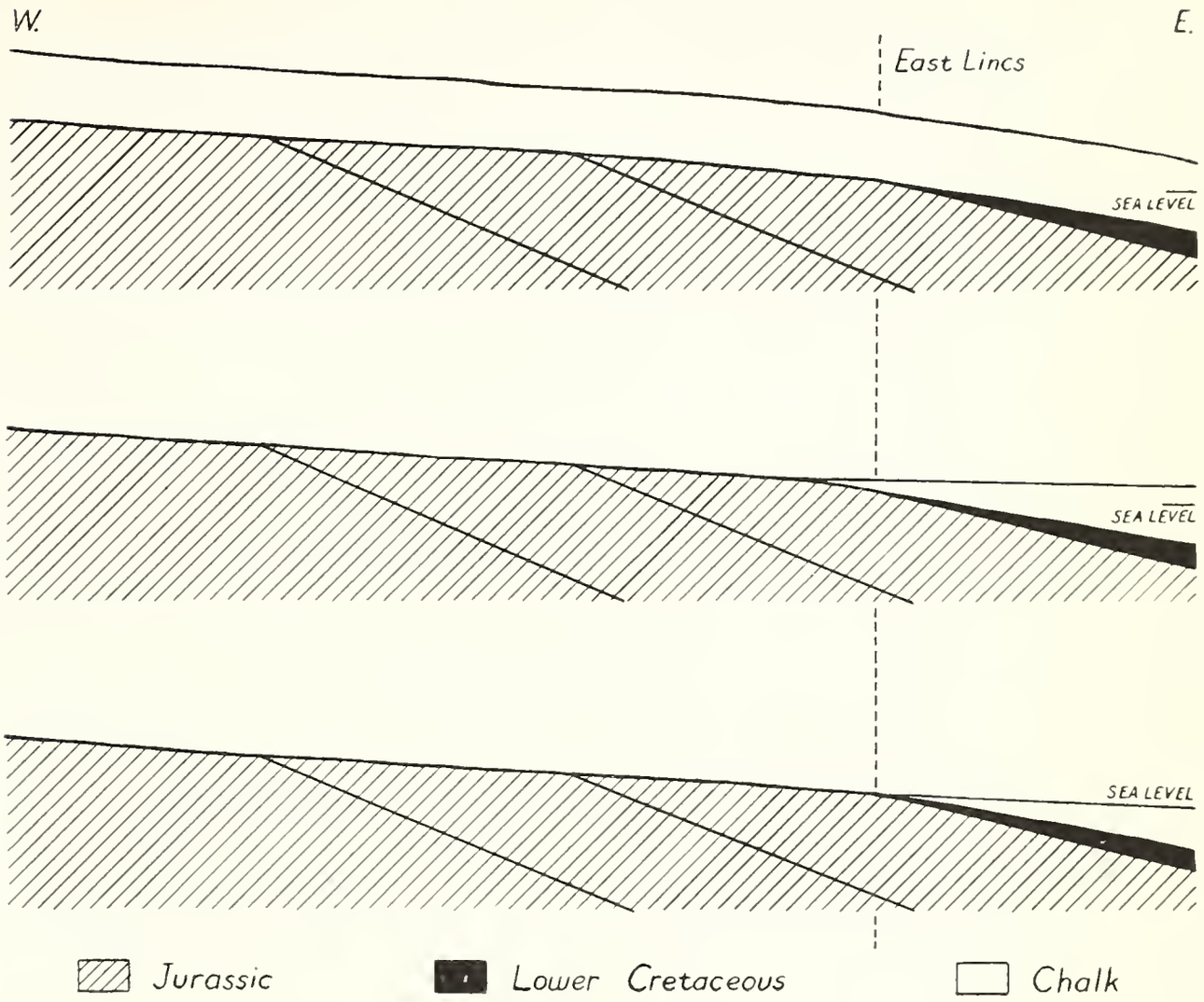
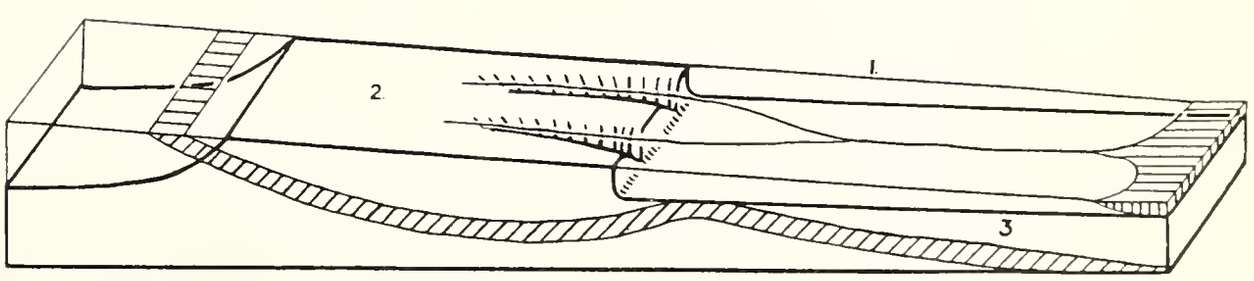
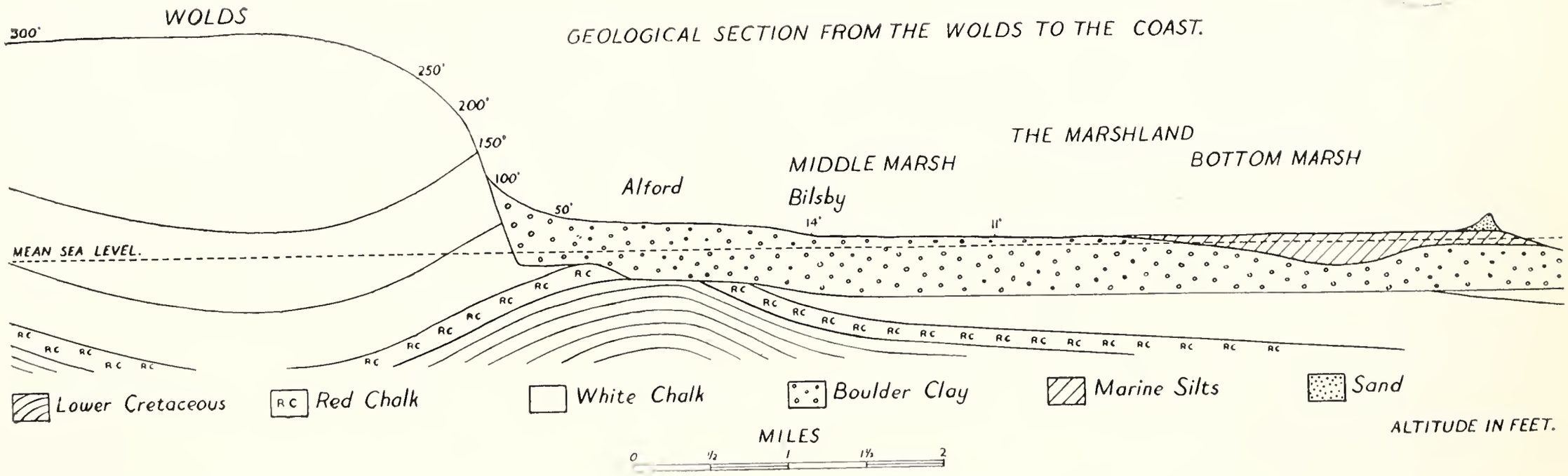


DIAGRAM ILLUSTRATING THE CHANGES PRODUCED BY AERIAL AND MARINE EROSION IN LATE PLIOCENE TIMES



1. Indicates the Early Pliocene Rivers, Land Surface and Coastline 2. Wolds
3 Wave Cut Platform Underlying the Marshland. Lower Cretaceous Beds.


WOLDS
GEOLOGICAL SECTION FROM THE WOLDS TO THE COAST.
300'
250'
200'
150'
100'
50'
Alford
MIDDLE MARSH
Bilsby
THE MARSHLAND
BOTTOM MARSH
14'
11'
MEAN SEA LEVEL.
RC
Lower Cretaceous
Red Chalk
White Chalk
Boulder Clay
Marine Silts
Sand
MILES
0
1/2
1
1 1/2
2
ALTITUDE IN FEET.

and then ceased cutting them more deeply. Meanwhile the rain and frost destroyed the valley sides and discharged the waste into the rivers which bore it away to the sea. Thus the valleys became wider and wider and the hills between became smaller and smaller until the surface of the land was converted into a low-lying gently undulating plain. It is not unlikely that the sea then spread slowly across this surface, slicing the hills away also, and consequently making the landscape still flatter. At the present time the only evidence for this explanation is the close similarity of the upper levels of the Wolds to those of the North Downs. There, however, marine deposits have been found at Lenham and elsewhere resting in pockets in the chalk surface at heights of as much as five to six hundred feet above sea level. It may be that careful field work will yet bring to light patches of similar deposits on the Wolds.

In later Pliocene times this flattened surface was uplifted, and apparently bent into a broad low arch with its crest running approximately east and west through Market Rasen and Saltfleet. This arch was also tilted gently eastwards. Its highest point, which lay near Market Rasen and Caistor, would be about six hundred feet above sea level. As this surface rose the present drainage system developed and aided by other denuding agencies did two important pieces of work. On the one hand it excavated the soft Kimeridge Clay and Lower Cretaceous sands and clay which cropped out to the surface west of the chalk, and thus brought into being that prominent scarp which bounds the Wolds on their western side. On the other hand they scored the surface of the plateau with numerous valleys.

While all this was going on the sea itself was not idle. Its waves beat against the low lying eastern margin of this plateau, and cut away its lowland slopes, until the coastline lay along the line where the Wolds now drop to the Marshland. At what date it reached this line is still a matter for discussion but it was certainly not later than the Middle of the Glacial Period or Pleistocene. The Marshland, as we

now know it, did not then exist. Its place was occupied by a broad wave-cut platform which was covered by the sea, and overlooked by a series of chalk cliffs like those which to-day overlook the English channel. The edges of these cliffs rose to a height of about three hundred feet where hill spurs had been truncated by the sea, but they sank almost to sea level where they passed across the valleys which descended from the Wolds. During the thousands of years that have since elapsed the edges of the cliffs have been rounded off and thus that prominent range of hills which overlooks the Marshland came into being. An inspection of the contours on the one inch Ordnance Survey map of this region still reveals the truncated character of the spurs.

Several times during the Glacial period or Great Ice Age the climate became so cold that extensive snow fields formed over the higher grounds of the British Isles. From these glaciers crept eastwards to the North Sea. There they encountered a much greater glacier which had its origin in the Scandinavian ice fields and was flowing south-westwards across the area we now call the North Sea. As this great glacier moved relentlessly forwards it diverted the smaller glaciers coming from Scotland and the north of England from their natural courses. Some of them were compelled to flow southwards along the east coast and the lowlands east of the Pennines, passing over East Yorkshire, Nottinghamshire and Lincolnshire.

All these glaciers attained their maximum volume and extent during the earlier part of the Ice Age, and for a short while completely smothered our area under a thick covering of snow and ice. The extent to which the surface of our area was scoured by this moving ice, or modified by deposits left behind when the ice melted, still requires much investigation. After a long interval during which the climate of this country was even warmer and more genial than it is now the glaciers returned. This time, however, they were much smaller and did not extend on to the Wolds. One glacier pushed its way southwards along the foot of the sea cliffs and over the wave

cut platform described above.

One phase in the retreat of this glacier deserves especial attention. During this the ice lay for a while with its edge banked up against the eastern slopes of the Wolds nearly as far south as Alford. From this point the ice margin turned eastwards through Mumby and Huttoft to Anderby or Chapel. Along this line it built up a series of low morainic hills upon which to-day farms and village are often situated. North of Alford the valleys, which opened eastwards towards the sea, had their mouths blocked by ice. In summer, when the snow upon the hills melted, the water flowed into the valleys and, because it had no way of escape, filled these up and formed little lakes. The level of the water continued to rise until at last it overflowed the hills between the lakes. This overflowing water, acting like a river, excavated for itself gorge-like channels across the hills, and flowing southwards from lake to lake eventually reached the sea. These overflow channels, as they are called, form a very interesting and pretty set of features in the eastern portion of the Wolds. The best known one is that which lies behind the Hubbard Hills at Louth and is now used as a public park.

Thus the outwash waters of the summer made for themselves a way of escape along the margin of the ice until they came to the vicinity of Alford. Thence they flowed eastward to the sea and no doubt formed those striking shingly deposits which may sometimes be seen on the beach north of Ingoldmells point.

When eventually the whole of the ice had disappeared they left behind them a thick accumulation of clay mixed with gravel and boulders. This was spread in a sheet some eighty feet thick over the surface of the wave-cut platform, and thus was laid down the foundation upon which the Marshland subsequently developed. This Boulder Clay, as it is called, is often to be seen exposed on the beach at low spring tide level. It is characterised by an undulating hummocky surface part of which is now buried under later deposits, but the remainder still forms that prettily wooded fringe of country known as the

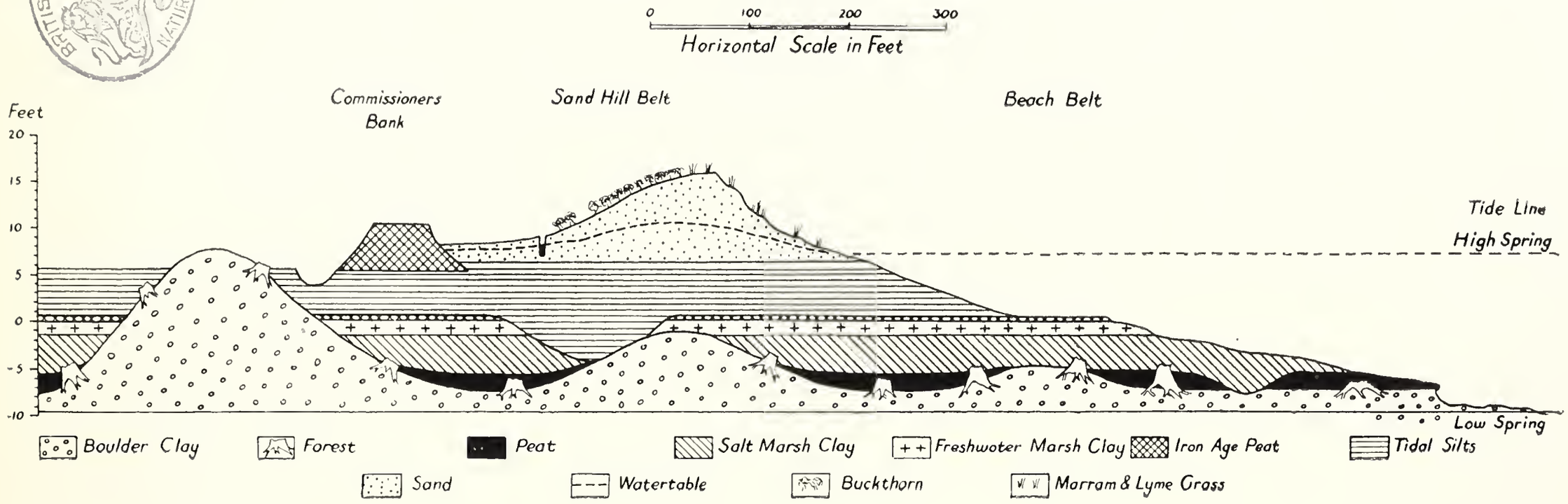
Middlemarsh which lies along the foot of the Wolds. Even where much of it is buried the higher hummocks may be seen sticking up here and there above the dead level surface of the Bottom marsh providing dry sites for farms and villages which are thus lifted above the wet marshland around.

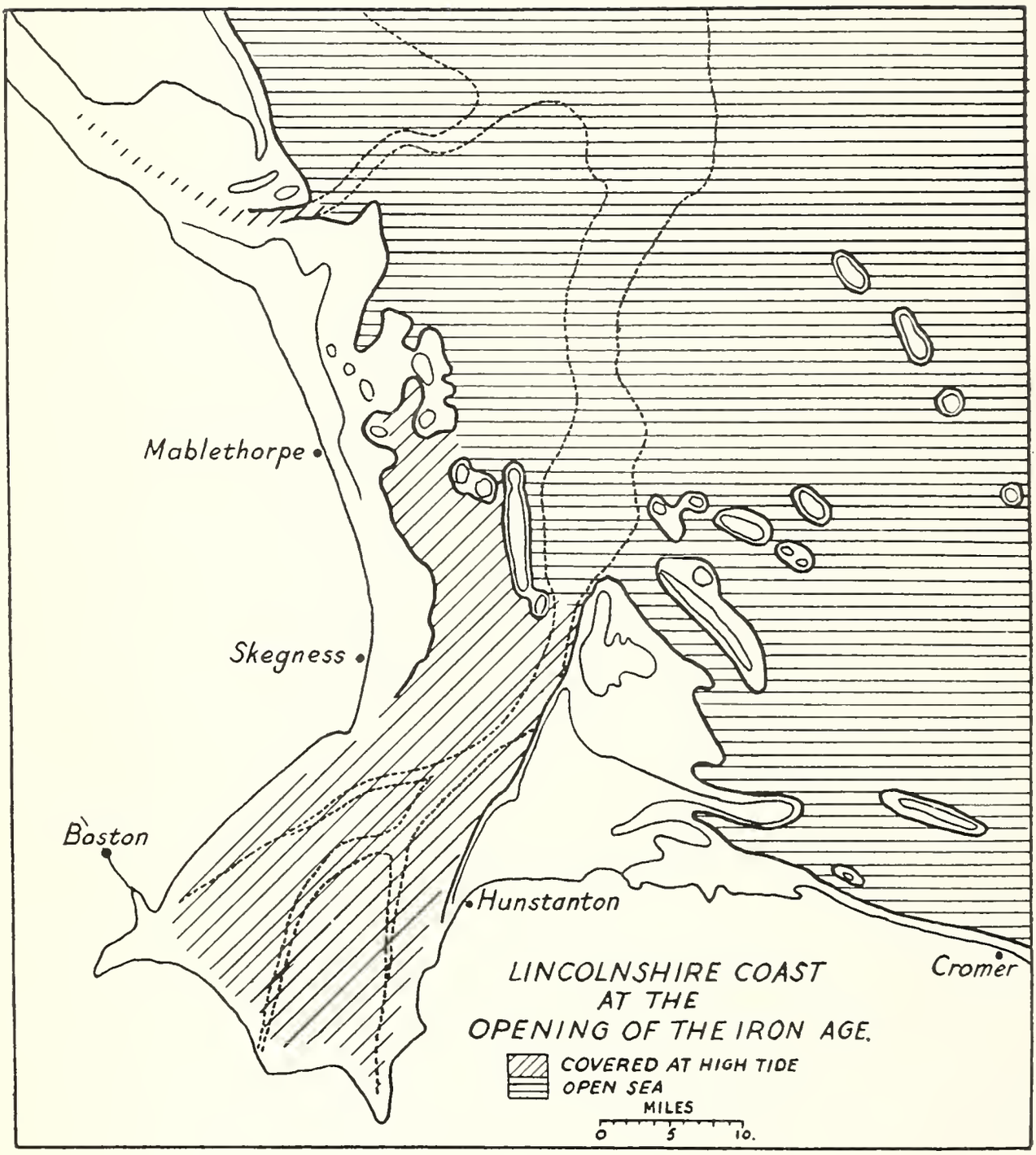
At the opening of the Post glacial period the level of East Lincolnshire was much higher than it is now, the floor of the adjoining portion of the North Sea was dry land and the coast was far away in Scottish latitudes. The fact that stumps of trees, lumps of peat and the bones and antlers of deer are from time to time dredged from the floor of the North Sea substantiates the view that much of this ground became clad with forests, at first of Pine and later of Oak and Birch. About the beginning of the New Stone Age or Neolithic period the level of the land began to sink slowly. This resulted in a slowing down of the rivers and streams and a consequent decline in the efficiency of the natural drainage. At the same time the climate became more moist. These two influences together led to the growth of peat bogs which smothered the roots of the trees and caused the forests of oak, birch and pine to perish. This peat enclosing the stumps and trunks of the trees which it killed, forms that "submerged forest" at the bottom of the beach which, when the tide is very low attracts the attention of the more observant holiday makers at many points between Mablethorpe and Skegness.

At last, as the result of the continued sinking of the region the sea begun to inundate most of the area which now forms the Bottom Marsh at every high tide, in the same way that it may still be seen spreading over the mudflats and salt marshes around the Wash. At each inundation the sea deposited a thin film of silt. Upon this glasswort, arrow grass, sea thrift, sea lavender and many other salt marsh plants grew. This is proved by the fact that between low and mid-tide marks the submerged forest and peat are covered by deposits of clay, eight to ten feet thick, in which are to be found abundant remains of every salt marsh plant which grows around the Wash today. It is evident from all this that in

BRITISH MUSEUM NATURAL HISTORY

GEOLOGICAL SECTION ACROSS THE COASTAL MARGIN




Mablethorpe
Skegness
Boston
Hunstanton
Cromer
LINCOLNSHIRE COAST
AT THE
OPENING OF THE IRON AGE.
COVERED AT HIGH TIDE
OPEN SEA
MILES
0
5
10.

the Marshland area conditions just as sheltered and quiet as those which exist to-day in the Wash prevailed for a long time. It is highly probable that the area was shielded from the onslaught of the rougher water of the open sea by some off-shore barrier. It is not unlikely that this was formed by a broken range of partially submerged morainic hills stretching from the Norfolk coast to Spurn Point.

Towards the close of the Bronze Age the sinking process ceased, and the level of the land became stationary or may even have risen slightly. As the sea no longer came in at the high spring tides the waters of the marsh became fresh, and the salt marsh plants were replaced by reeds and bulrushes. In the vicinity of Ingoldmells the ground seems to have been drier and consequently became overgrown with bushes and small trees including cherry and alder. The leaves and twigs with the debris of other small plants formed a thin layer of peat, extensive patches of which are visible to-day at mid tide level on the beach.

Here among the brush wood and alongside of the tidal channels which still ran across the area, the first iron age people established saltworks. These very simple affairs consisted of shallow hearths a little more than two feet wide and about five feet long. In these they put large crude dishes which they made on the spot and supported on rough pedestals of clay. Into each dish they poured sea water from the tidal channels and then lighting fires around and underneath the dishes they evaporated the water and extracted the salt. The district around Ingoldmells must have been a veritable hive of industry for no less than ten such saltwork sites have been seen exposed on the beach just north and south of the point. They have also been seen at various places inland where new drains have been excavated down to the level of the thin peat. Since salt was such an important commodity it is not surprising that when the Romans came they established a station at Ingoldmells, close to the spot where Ingolmells Point now stands. To-day the lower layers of the Roman occupation earth lie at approximately the same level as the Iron age salt-

works and the upper layers are covered by the sea at every high tide. On the inland side of the sandhills this earth and other saltwork sites are hidden under a covering of Marine silts in the form of sloppy clay. This clay may be seen cropping out to the surface along the upper half of the beach. The mere fact that the saltworks occur at the mid tide level and the Roman station only just above this shows that at the end of the Roman occupation and during the centuries which followed the process of sinking was once more renewed, with the result that the Marshland was again inundated by the sea. This time however sinking took place more rapidly with the result that the area was below the level favourable to the growth of salt marsh plants all the time. On the other hand the presence of myriads of cockle and oyster and scrobicularia shells, especially in the bottom layers, shows that the ground was still exposed at low tide.

Inasmuch as the sea continued to deposit mud and silt it is evident that the situation was still sheltered from rough seas, and that the offshore barrier still existed. Nevertheless that barrier was now less efficient, for the process of sinking affected it also, with the result that the channels through which the sea entered the area were much wider. Thus reduced in level the barrier did not resist the onset of the waves for a much longer period. It seems probable that during the twelfth and thirteenth centuries the barrier was completely destroyed, for then this part of Lincolnshire suffered from a number of severe marine floods. From that time onwards the waves have been relentlessly wearing away the outward fringe of the Marshland and have cut back its margin to its present position. This is indeed a fortunate circumstance for the East coast of Lincolnshire which, instead of being a vast expanse of sloppy clay, now has miles of golden sands upon which the long lazy rollers break with a music that soothes the frayed nerves of the industrial holiday maker.

The same bracing breezes, which cast the rollers on the beach, have drifted the sand inland, and piled up the sandhills which form such a charming and invaluable addition to the amenities of this coast.

THE NEUROPTERA OF LINCOLNSHIRE.

A. Roebuck, n.d.a., f.r.e.s.

The composition of the Order Neuroptera has changed much during the last half century. Authorities are by no means agreed yet as to its precise limits. This article deals with three very distinct groups. Useful small books to study are "British Neuroptera, with Supplement, 1934", by F. J. Killington, and "British Mecoptera" by B. M. Hobby and F. J. Killington. More detailed information, especially of the earlier stages is given in "Notes on the Biology of some British Neuroptera (Planipennia)", by C. L. Withycombe in the Transactions of the Entomological Society of London, Parts III & IV, 1922. Of 64 British species we have records of 25 in the County.

In the following account the first records with date, locality and finder are given. Other localities where known are stated.

The insects are carnivorous in larval and adult stages. They have four membranous beautifully net-veined wings. In nearly all species the two pairs are very similar. At rest they meet at an angle over the back like a roof. Metamorphosis is complete, the pupa being quiescent.

SUB-ORDER I. MEGALOPTERA.

This is considered by some authorities to be a separate Order. The larva resembles a carnivorous coleopterous larva and has masticatory mouth parts.

Fam. 1. **Sialidae** (Alder Flies).

Head and Thorax squared. Egg masses familiar on grasses, etc., near water. Two British species, wing expanse 20-40 mm.

Sialis lutaria L. (Otter Fly).

Farlesthorpe 1887 (J. E. Mason). Well, Brocklesby, Great Coates, Freshney Bog, Bottesford, Linwood. **Very common.**

S. fuliginosa Pict.

Market Rasen 1912 (C. Morley and E A. Elliot).

Fam. 2. **Raphidiidae** (Snake Flies).

Head and prothorax much elongated. Female with long ovipositor. Larvae in bark and rotten wood. Wing expanse 35-50 mm. Four British species.

Raphidia xanthostigma Schum.

Wrawby Moor 1906 (G. W. Mason), Market Rasen, Roxton.

SUB-ORDER II. PLANIPENNIA.

A very uniform group of great economic importance as they feed on aphids etc. Very good work could be done by observers if they would rear those found preying on aphids, noting also the species of aphids. The larvae have their mouth parts modified for piercing and sucking. There are five British Families.

Fam. 1. **Osmylidae.**

Contains only one British species, the rare and beautiful *Osmylus fulvicephalus* Scop.

Fam. 2. **Sisyridae.**

Resemble the next family closely but the wing venation is different. Larvae aquatic living in or upon Sponges. There are three British species.

Sisyra fuscata Fab.

Torksey 1929 (A. Roebuck). Wings brown, expanse ½ inch.

Fam. 3. **Hemerobiidae** (Brown Lacewings).

Delicate insects with brown or yellow wings. Mostly nocturnal fliers, resting during the day. Larvae feed on aphids and other small insects. Wing expanse 10-23 mm. There are 27 British species.

Sympherobius elegans Steph. (*striatellus* Klap.).

Alford 1888 (J. E. Mason). A dark species found on beeches etc.

S. inconspicuus McLach. (*fuscescens* Wallengr.).

Well or Alford 1888 (J. E. Mason). A specimen was found by Mr. K. J. Morton amongst Mr. Mason's series of the last species.

Hemerobius micans Oliv.

Well 1888 (J. E. Mason). Yellowish wings lightly spotted black. Found on beeches etc.

H. humuli L.

Well 1888 (J. E. Mason), Limber. Yellow spotted black. Found on hazels etc.

H. lutescens Fab.

Morton 1928 (A. Roebuck). Pale yellow spotted black. On beeches etc.

H. stigma Steph.

Market Rasen 1907 (G. W. Mason). Reddish-brown or dark brown. On conifers.

Boriomyia subnebulosa Steph.

Alford 1887 (J. E. Mason), Barton-on-Humber. On beans and all sorts of plants. Dark grey.

B. nervosa Fab.

Alford 1886 (J. E. Mason), Wrawby Moor, Spalding. Dark grey. On apple trees etc.

Wesmaelius quadrifasciatus Reut.

Cuxwold 1914 (F. W. Sowerby). Grey with four dark markings. On conifers.

Micromus paganus L.

Alford 1888 (J. E. Mason), Goxhill, Louth, Market Rasen. Greyish. On low plants.

Fam. 4. **Chrysopidae** (Green Lacewings).

Colour green except in *Notochrysa* species which are brown. White eggs laid on stalks. Wings delicate but broader than in the last family. Larvae devour aphids etc. There are 15 British species. Wing expanses 22-45 mm.

Chrysopa flava Scop.

Barton-on-Humber 1907 (G. W. Mason).

C. vulgaris Schn.

Barton-on-Humber (F. P. H. Birtwhistle). Hibernating forms sometimes red (*carnea* Steph.).

C. alba L. (*ciliata* Wesm.).

Greenfield 1887 (J. E. Mason), Market Rasen, Bradley.

C. flavifrons Brauer.

Greenfield 1889 (F. Altoft).

C. septempunctata Wesm.

Alford 1888 (J. E. Mason), Greenfield, Barton-on-Humber.

C. perla L.

Greenfield 1889 (F. Altoft), Market Rasen, Louth.

Notochrysa capitata Fab.

Tothill Wood 1890 (J. E. Mason). Wings brown. Found again in 1904 by G. T. Porritt.

N. fulviceps Steph.

Aythorpe 1889 (F. Altoft). This specimen was found by Mr. Porritt in Mr. Mason's collection in 1895. It was further examined by Mr. McLachlan.

Fam. 5. **Coniopterygidae** (Mealy Wings).

Small and very small insects entirely covered with a white waxy powder. Wing venation simple. Hind wings smaller than forewings. Semi-gregarious, on shrubs and trees. Wholly beneficial as the larvae feed on scale insects, mites etc. There are 8 British species. Wing expanse 5-8 mm.

Conwentzia psociformis Curtis.

Kettlethorpe 1932 (A. Roebuck).

SUB-ORDER III. MECAPTERA.

Most authorities now consider this an Order. The head is extended downwards forming a prominent beak. The larvae resemble caterpillars and both they and the adults are carnivorous.

Fam. 1. **Panorpidae** (Scorpion Flies).

In the male the terminal segments of the abdomen are curved up like the tail of a scorpion. Larvae in the ground. There are 3 British species. Wing expanse over 1 inch.

Panorpa communis L.

Greenfield 1889 (F. Altoft), Kirton Marsh, Great Coates, Freshney Bog, Trusthorpe, Barton-on-Humber, Scotton Common, Torksey, Ludborough, Thoresby, Caistor. A very common insect.

P. germanica L.

Well 1888 (J. E. Mason), Greenfield, Cuxwold.

Fam. 2. **Boreidae.**

There is one British species *Boreus hyemalis* L. It is wingless, about ¼ inch long and frequents moss during the winter.

Report of the Hon. Secretary,

1936.

Field Meetings have again been the main feature of our activities. These have been well attended and although the weather was not too favourable on several occasions, the results were very satisfactory.

The One-Hundred-and-Seventy-sixth meeting, held on May 23rd at Limber, was mainly for the study of bird-life. There was a record attendance of members and in many ways the meeting was an outstanding event. The party was under the able guidance and leadership of Mr. Reg. May of Limber and Mr. S. A. Cox of Grimsby, secretary of the ornithological section. The Hendale and Cottagers' Dale woods were visited by permission of the Earl of Yarborough. A feature of the meeting was the number of nesting species of birds that were seen, which was made possible by the extensive preliminary investigations of Mr. May. Nests of the Long-eared Owl, Tawny Owl, Garden Warbler, Chaffinch, Whitethroat, Blackcap, Willow Wren, Great Tit, Long-tailed Tit, Robin and Linnet were seen. Tea was taken at the New Inn, Limber, after which reports were submitted and Mr. W. B. Havelock described the system of forestry adopted on the estate.

The One-Hundred-and-Seventy-seventh meeting was held

on June 18th at Stoke Rochford. The Park was visited by permission of Mr. Christopher Turnor, J.P., and the members were received by Mrs. Turnor. The party was under the guidance of Mr. A. E. Musgrave and Mr. H. Preston of Grantham. A picturesque fall of water in the Park, one of the sources of Grantham's water-supply, was described by Mr. Musgrave. The freshwater limpet (*Ancylus fluviatilis*) was found adhering to the stones at the source of the fall, and the Golden Saxifrage (*Chrysosplenium oppositifolium*) was growing luxuriantly by the water. Mrs. Turnor entertained the members to tea at the Hall. Mr. A. Roebuck occupied the chair at the meeting following at which the reports on the day's work were given.

The One-Hundred-and-Seventy-eighth meeting was held at Scotton Common on July 18th. Members assembled in the Market Place, Gainsborough and went by car to the Common which was visited by permission of the Forestry Commission. The members were under the leadership of Mr. J. J. Allen of Scotton and Miss W. Barlow of Gainsborough. A most interesting day was spent on what is probably Lincolnshire's best-known hunting ground for the naturalist. Some of the rarities recorded for the Common were encountered. The botanists noted among a list of some one hundred flowering plants, the Round-leaved Sundew *(Drosera rotundifolia)*, Long-leaved Sundew *(D. anglica)*, Bog Asphodel *(Narthecium ossifragum)*, Bog St. John's Wort (*Hypericum elodes)*, Bog Pimpernel *(Anagallis tenella)*, Marsh Gentian (*Gentiana Pneumonanthe)*, Cotton Grass *(Eriophorum angustifolium*) and Petty Whin (*Genista anglica)*. Insects were particularly scarce. Tea was taken in Gainsborough by invitation of Miss Barlow.

The One-Hundred-and-Seventy-ninth meeting was held at Ingoldmells on August 6th. In spite of almost incessant rain the complete programme was carried out under the guidance of the President, Prof. H. H. Swinnerton. The enthusiasm and interest of the members was indicated by the fact that most of those present remained with the party throughout the day, despite the inclement conditions. The tide was favourable

and a representative succession of deposits was exposed. With graphic description, Dr. Swinnerton outlined the history of the coast from glacial times to the most recent phases and was able to show the sites of the Early Iron Age salt-workings upon which he had carried out considerable research. On account of the conditions the usual tea and business meeting was not held, but our thanks are due to Dr. Swinnerton for an extremely interesting day.

The One-Hundred-and-Eightieth meeting was held at Hartsholme Park, near Lincoln, by kind permission of the Earl of Liverpool, on September 12th. The weather was again not too favourable but several interesting observations were made. A Great-crested Grebe was seen on the Lake, which is not listed as an official breeding ground for this bird. It will, therefore, be interesting to see if the species will eventually nest here. Fungi were very plentiful. A gall *Cecidomyia veronicæ* attacking the terminal buds of the Germander Speedwell (*Veronica Chamaedrys*) was very noticeable. It caused the formation of a loose woolly capsule at the apex of the shoot. Tea was taken in Lincoln; afterwards the usual reports were received.

The One-Hundred-and-Eighty-first meeting was held at Nettleton Ironstone Mine on October 3rd. The day was devoted to the study of the Lower Cretaceous rocks of Lincolnshire, particularly the Claxby Ironstone. The leader of the party was Dr. Swinnerton who described in detail the main geological features of the Wolds. By permission of the Directors of the Mid-Lincolnshire Iron Co., Ltd., the party was conducted into the mine and shown the method of working the ironstone, also geological features encountered during mining operations. The meeting concluded with tea at Holton-le-Moor.

We again acknowledge help received in the organisation of these meetings. Particular reference must be made to the owners of estates who have granted permission to hold meetings, and to those who have entertained us and helped with the local arrangements. We also appreciate the help received

in overcoming transport difficulties from members attending the meetings by private cars.

I regret to record the death of four of our members. Mr. A. King of Scunthorpe died on April 18th. He had been a member since 1931. By the death of Mr. S. J. Hurst of Boston on October 22nd the Union, and the Botanical section in particular, lost a keen worker. Mr. Hurst was present at several of our Field Meetings this year, and little did we think at the Hartsholme meeting, that we should have to deplore his loss in this annual report. He was regular in his attendance at the meetings and by his personality and enthusiasm was the means of stimulating much botanical work. He had been a member of the Union since 1923 and was on one occasion invited to become its President, but though appreciating the honour his fellow members wished to confer upon him, he declined, feeling there were others who would more ably fill the position. In November we lost another member of long standing by the death of Mr. Stafford Walter of Horncastle. He had been a member since 1918 and had on several occasions contributed notes to the Transactions. Mr. Charles Scorer of Lincoln, also one of the earliest members of the Union, died in December in his 90th year. The first record of his membership was in 1896, and he had been a regular subscriber since that date.

There has been a further increase in the membership during the year, and we are again grateful to members who have helped to maintain this annual increase by inviting others to join. Two Life Members and twenty-eight Ordinary Members have been elected, making the total membership 211, which, allowing for losses by death and resignation, is an increase of 18 upon last year.

The following were elected during 1936 :—

Life Members. Mr. Joseph Billiat, London and Mr. Eric A. Knott, Humberston. Ordinary Members. Miss S. J. Arscott, Scampton; Mrs. M. Barlow, Lincoln; Miss K. Blair, Scunthorpe; Mr. W. A. Buckpitt, B.Sc., N.D.A., N.D.D., Lincoln; Mr. Charles E. Burgess, Cleethorpes; Mr. A. E.

Charles, Friskney; Mr. Francis J. Cooper, A.L.A., Lincoln; Mr. G. R. Fenton, Gainsborough; Mr. G. A. Grounds, Boston; Mrs. E. M. Heaton, Riseholme; Mr. G. E. Hewitt, Heapham; Mr. A. Hinchley, Donington; Mr. F. B. Howell, Blyton; Mrs. M. Jeudwine, Lincoln; Mrs. W. M. Leeke, Lincoln; Mr. A McVicar, B.Sc., N.D.A., N.D.D., Lincoln; Mr. Richard Mason, Lincoln; Mrs. M. L. Mason, Lincoln; Mr. Edward Mason, Lincoln; Mr. A. J. Melton, Lincoln; Miss D. Morley, Scunthorpe; Miss E. M. Power, Cleethorpes; Mrs. M. Russell, Louth; Mr. E. Sewards, Scunthorpe; Mr. W. G. Summers, Grantham; Mr. S. B. Vickers, B.Sc., Tealby; Mr. E. R. Walter, M.Sc., Lincoln; Mr. W. Williams, Borough Fen.

Sectional Officers' Reports.

BOTANY.

F. T. Baker.

The Bog Violet (*Viola stagnina*) has been considered for many years as probably extinct in Lincolnshire. This year, however, has seen the re-discovery of this rare and interesting plant in the parish of Fiskerton (Div. 6; V-c 54) by Mr. E. E. Steele. It was growing in fen soil and in a very healthy condition. There were several large patches flowering freely. It is a tall, slender violet with very pale blue, almost milk-coloured flowers. The narrow ovate leaves are rather widely separated on long peduncles. It is interesting to note that the species was first recorded for Britain by Dr. John Nicholson who found it growing on both sides of Boultham Lane, Lincoln in 1839. It was thus a Lincolnshire discovery. It was subsequently found at Manton Common (Div. 2) and in the parishes of Skellingthorpe, Potterhanworth and Branston (Div. 13). All these, with the exception of Manton and Skellingthorpe, are fenland habitats. At Fiskerton it is north of the River Witham; at Potterhanworth and Branston, south of the river (V-c 53).

The rare Lizard Orchis (*Orchis hircina*), discovered near Tetford by Miss E. J. Gibbons in 1929, has flowered again this year. It flowered in 1929 and 1930 and in both cases, being in an exposed position, it was plucked. The flowering this year is thus most interesting as it is believed that to pluck the flower of these rare orchids results in the death of the plant. In this case, which is conclusively the same plant, it has flowered again but after a lapse of six years.

The Oxford Ragwort (*Senecio squalidus*) has now appeared on the slag heaps of Scunthorpe where it was noticed by Miss E. J. Gibbons. Though the plant has been rather a long time reaching Lincolnshire it now appears to be spreading. It seems possible that it may now cover the slag heaps of Lincolnshire with its golden flowers, just as it has done the scrap-heaps of Staffordshire. It flowers very early and remains in flower until the autumn. This is a useful point in distinguishing it from the summer-flowering Ragwort (*Senecio Jacobaea*).

We are again grateful to members who have submitted notes for inclusion in the manuscript flora of the County.

The new divisional records for the year are :—

Div. 4. *Dipsacus pilosus*, Stainton-le-Vale, Miss E. J. Gibbons.

Div. 8. *Asplenium Ruta-muraria*, Louth, Miss C. D. Marsden.

Div. 9. *Salvia Verbenaca*, Theddlethorpe, Miss C. D. Marsden.
Hieracium umbellatum, ,, ,,
Sisymbrium altissimum, ,, ,, (Alien)

Div. 10. *Sisymbrium altissimum*, Woodhall Spa, Miss C. D. Marsden.

Div. 11. *Sisymbrium altissimum*, Skegness, Mr. S. J. Hurst.

Div. 13. *Hypochaeris glabra*, Hartsholme, Miss E. J. Gibbons.

Div. 17. *Papaver hybridum*, Surfleet, Miss J. Cooke.
Ranunculus parviflorus, Surfleet, Miss J. Cooke.
Tragopogon porrifolium, Donington, Mr. F. L. Kirk.

MOSSES.

G. H. Allison.

The following interesting species and varieties have been gathered during the autumn of 1936.

Sphagna.

Sphagnum fimbriatum Wils. var. *validus* Card. 5, Laughton. A rather unusual form. The lower half of the branches bore leaves with squarrose recurved apices. In the capitulum and lower on the stem were specialised branches bearing antheridea in the leaf axils.

S. molle Sulliv. 1, Haxey. 5, Laughton. 7, Usselby. All found in wet situations and with short weak stems.

S. amblyphyllum Russ. var. *mesophyllum* Warnst. 7, Usselby.

S. obesum Wils. The type form. 1, Haxey.

var. *plumosum* Warnst. 5, Laughton. These were robust submerged plants, displaying plumose swollen branches.

S. inundatum Russ. 1, Epworth and Haxey. A large form.

S. Camusii Card. 1, Epworth. This is an uncommon species and it is satisfactory to note that it was found in quantity and good condition in this area. The record for 1933 was based on a very few stems. Both the concave and convex sides of the leaves are provided with numerous pseudopores but with few true pores. These are microscopical features requiring high magnification to determine their nature and true position in the leaf cells. This plant was tested by Mr. A. Thompson.

The species referred to here are very beautiful objects when a prepared section or portion of leaf or stem is placed under the higher powers of the microscope. The cells and cell walls become objects of great beauty and delicacy.

Liverwort (Hepatic).

Sphenolobus (Lindb.) Steph. *exsectiformis* (Breidl.) Steph. 7, Usselby. Uncommon.

These plants belong to the section having the leaf in the form of two lobes; the antical lobe bent up over the postical. In our plant the antical lobe was reduced to a mere tooth. Red gemmae, clustered around the leaf apices, caused the tufts of minute matted plants to become conspicuous. The triangular form of the gemmae in this species distinguishes it from the closely allied species *S. exsectus*.

NOTES ON THE ECONOMIC ZOOLOGY OF LINCOLNSHIRE DURING 1936.

A. Roebuck.

The pests of cultivated plants have been markedly different from those which have occurred during the past few years.

General Pests.

Cutworms (*Agrotis* sp.) continued to be very destructive to crops during the Autumn of 1935, e.g. on carrots, celery, turnips, on potatoes in store and on the young wheat. In the early part of this year there were some scattered severe attacks but the epidemic died down and they now seem to be scarce.

Slugs, especially *Agriolimax agrestis*, became more numerous during late 1935 and they caused damage on a variety of crops this year.

Wireworms (*Agriotes* sp.) were much more abundant and destructive.

Leatherjackets (*Tipula* sp.) were restricted to the grassland and did not cause material damage.

The glistening white worm-like larvae of *Thereva* flies were abundant on arable land. They are predaceous and therefore useful.

Eelworms.

These microscopic worms have been especially important this season.

Anguillulina dipsaci has for some years been harmful to bulbs and potatoes in the Holland Division and to phlox and chrysanthemums in different parts of the County but this year it has been destructive to fields of oats near Alford. In the Autumn of 1936 this eelworm appeared on the maturing sugar beet roots producing a kind of crown rot or canker. This is quite a new host plant for the eelworm, there being no previous record anywhere. It occurred in a number of places in the Isle of Axholme.

Heterodera schachtii has been the worst pest on the potatoes in the County for some years especially in the Fens, the Isle of Axholme and along Trentside. This year it has been re-

corded in a greenhouse attacking tomatoes near Grimsby and the notorious strain which is so destructive to sugar beet on the Continent has appeared in this County in two fields. On one it has occurred on sugar beet, swedes, and mangolds and on the other on swedes only.

A peculiar feature of eelworms is their formation of races attached to particular crops, or groups of crops.

Cereals.

Of the cereals, wheat was the only one which suffered considerable damage from pests. Wheat Bulb Fly *(Leptohylemyia coarctata)* was very destructive and was chiefly responsible for the severe gapping of the crops. The developing grain was later attacked by Thrips *(Limothrips cerealium)* and the Midges *(Contarinia tritici*, and to a less extent *Sitodiplosis mosellana)*. In addition two interesting pests appeared, the Wheat Sawfly *(Cephus pygmaeus)* and the Hessian Fly (*Mayetiola destructor)*. Both these damage the base of the straw causing it to break down before the harvest. Fortunately neither were very destructive.

Sugar Beet.

Wireworms (*Agriotes* sp.) were the most widespread and destructive pests on this crop and they were worse than for many years past.

The Millepede *(Blanjulus guttulatus)* was more abundant and destructive than previously. It has become very fond of the seeds and seedlings of this crop in recent years.

The Silver-Y Moth (*Plusia gamma*) has a most interesting story this year. At the end of May and throughout June there was an extensive migration of these insects from abroad over this country. By the end of August the larvae from these were nearing maturity, after making holes in the beet leaves. In September a new brood was emerging from cocoons under the beet leaves. The beet was riddled with their attacks all over the County. They were last numerous in 1933 but nothing like so plentiful as this year. Fortunately the attacks were sufficiently late so that little damage was done. An interesting problem now arises,—will there be a return flight

to the Continent? From one of these was bred the parasitic Tachinid fly, *Nemorilla floralis.*

Cockchafer Grubs (*Melolontha melolontha*) were destructive over a large part of the County. In the 1934 Transactions Mr. Baker reported an extraordinary abundance of the adults. These grubs are the offspring of those beetles which laid eggs two years ago.

Three unusual pests appeared but in small numbers. The very beautiful Tortoise-shell Beetle (*Cassida vittata*) and its larvae attacked crops in several parts of the County. The larvae of *Silpha* beetles attacked a crop near Whitton. Larvae of the Broom Moth (*Melanchra pisi*) also attacked beet in small quantities in the east of the County.

The other pests were much below normal.

Turnips, Swedes, etc.

Except for wireworms, insects were not harmful to these crops. The aphis, *Brevicoryne brassicae*, so destructive last year, did no damage this season although the eggs hatched in abundance towards the end of March.

A new pest to the County appeared on a field of turnips in the Alford district. This was the Turnip Mud Beetle (*Helophorus rugosus*). It destroyed several acres of what was a very poor crop in the early months of the year.

Miscellaneous Crops.

The Carrot Fly (*Psila rosae*) did more damage than usual on Celery in the Isle of Axholme. It was rather scarce again on Carrot crops.

The Pea Thrips (*Frankliniella robusta*) was much more abundant than usual.

The Snail (*Helix nemorosa*) was present in such large numbers on one field of young clover in October that it did much damage.

Trees and Shrubs.

The beetle *Tetropium gabrieli*, new to the County, caused much damage to larch trees at Hackthorn and Kettlethorpe. From a log cut from one of these trees, 9 inches diameter and 18 inches long were reared 21 beetles.

A new and important bug has appeared in the County. It is the Rhododendron Bug (*Leptobyrsa rhododendri*) and was sent to me from Grimsby by Dr. Wallace. This is a notable addition to our list of Hemiptera published in the last issue of the Transactions.

Beech trees to the north of Lincoln had their foliage extensively eaten by the larvae of the beetle *Orchestes fagi*.

The mite *Tetranychus tiliarum* appeared in such numbers on trees near Grimsby that the trunks and branches were completely enshrouded by its webs.

Tortrix viridana defoliated the oaks in places, notably Potter Hanworth Wood. On these rooks fed extensively. On the wild roses in Potter Hanworth Wood there were numbers of the larvae of the Leaf Rolling Sawfly (*Blennocampa pusilla*). This was very destructive to cultivated roses in 1931, but has been virtually absent since. Possibly this year's find indicates it is on the increase and may shortly become a pest again.

The Pear Leaf Blister Mite (*Eriophyes pyri*) was more abundant than usual.

The Pear Midge (*Contarinia pyrivora*) appeared on an unusual host, *Pyrus salicifolia*, at Stoke Rochford.

Two new Scale insects were recorded for the County. *Pulvinaria vitis* on Vines in Lincoln and *Lecanium hesperidium* on Sweet Bay also at Lincoln.

On the same Sweet Bay shrubs there were large numbers of a Psocid fly, *Ectopsocus briggsi*.

Indoor Pests.

Much damage was done to sacks and grain in one large store during the early months of the year by the moths *Tinea granella* and *Endrosis lactella*. The latter insect had spun enormous amounts of webbing over the sacks. The appearance of the sacks was extraordinary. In the dim store the light from the distant windows glinted on the webs giving the sacks the appearance of being covered with thick hoar frost. The strength of the web was such that it took two men to pull the bags straight after the string had been cut.

ENTOMOLOGY.

A. E. Musgrave.

During the year we have been favoured with two very pleasant surprises; the occurrence in number of the Red Underwing Moth (*Catocala nupta*) and a successful season for the Holly Blue (*L. argiolus*). It is a pleasure to know that the latter, one of the most delicately beautiful of our British butterflies, is becoming established in the County. It was somewhat of a disappointment that, in spite of careful observations in its usual haunts on every sunny day the Comma butterfly was not seen in the Grantham district. We know, however, that this species was not absent from the County. Mr. T. H. Court picked up a specimen at Lynwode on August 25th. It had been knocked down by a car but was undamaged. The Red Underwing Moth was noticed by Mr. Cyril Taylor, formerly of Skellingthorpe, while travelling by road from Lincoln to Southwell. He saw two on a telegraph post and managed to get them in a match box, and counted some 30 others on the journey. Several of my entomological friends at Nottingham were informed and a week later one of them, Mr. Hodson, visited the road and was successful in taking six good specimens. The moths were in the best condition during the last week of September. Mr. S. J. Hurst also records this moth from Div. 12 and Div. 17, Boston.

The record of the Holly Blue butterfly comes from Mr. M. W. Graham at Old Bolingbroke. His notes are of such interest that I am tempted to quote them in full. He writes "The Holly Blue (*L. argiolus*) which I noticed here last year, had a successful season May 10th to June 10th. This year a fair number of females were seen, and I am able to record the occurrence of this species at West Keal, East Keal and Miningsby, besides several new haunts in this village. I was delighted to find several of these tiny creatures flickering above the hollies again in August. The habits of this brood were strikingly different from those of the earlier one. Whilst the early butterflies rambled over the hollies only a few feet

from the ground (the males often alighting on the flowers or on patches of moisture), the later ones stayed forty or more feet up in the trees. I remember with what suspense I watched their activities under the very eyes of a party of flycatchers. It was curious to observe how they moved round a tree during the day so as to remain on the sunlit side. As the month wore on their flight became more feeble and they began to descend. On September 15th the last battered survivor fluttered down to settle on a flower. I took the butterfly on its flower, indoors, the next morning it was dead. There seemed something pathetic in this intimate glimpse of a failing life among the falling leaves". The Holly Blue was also observed by the Rev. H. E. Stancliffe in his garden at Belton, and one specimen (a male) was seen at Bridge End near Donington on May 16th by Mr. F. L. Kirk.

Mr. Graham also records the Large Tortoiseshell (*N. polychloros*) near Woodhall Spa on April 30th; an unexpected early record. The Green-veined White (*P. napi*) appeared on April 23rd, but the Orange Tip (*E. cardamines*) was very late. This was also noticed in the Grantham district. The Large Skipper (*O. venata*) and Common Blue (*P. icarus*) were flying together quite plentifully in June. Many of the females of the latter were almost wholly blue like the male. This butterfly was common in the first brood at Saltersford. A rare and interesting variety of the species was taken during August at Woodhall Spa by Mr. James Mason. It was the hermaphrodite variety; the left wings being entirely male in colouration and the right female. The Chalk Hill Blue (*L. coridon*) was recorded as common at Ancaster on August 17th by Mr. F. L. Kirk, who also noted the Brown Argus (*A. agestis*) and the Speckled Wood (*P. ageria*) at Newhall Wood (Holywell) on the following day. The Marbled White (*S. galathea*) and Dark Green Fritillary (*A. aglaia*) were both noted in Mareham Lane, Sleaford, on July 21st by Mr. Kirk.

Mr. Graham remarks that in his district larvae of the Small Tortoiseshell (*A. urticae*) were exceedingly abundant. The Gatekeeper (*M. tithonus*) extended its range, but the Small

Heath (*C. pamphilus*) and the Wall Butterfly (*P. megera*) were very scarce. In June a relatively large number of worn examples of the Painted Lady (*V. cardui*) were seen along the road above Bolingbroke, undoubtedly migrated specimens. This species was less frequent in August and September, probably owing to unfavourable weather conditions, though a few were seen at Skegness on August 25th. Odd specimens were noted at Boultham, 30th August, Mr. C. P. Arnold; Middle Rasen, 24th June (2 specimens), Mr. T. H. Court; Ropsley Wood, 23rd August, Mr. F L. Kirk, and Sleaford, 17th September, Miss S. C. Stow. Miss Stow also records that she observed numbers of Small Tortoiseshells, some of a very pale colour, one almost lemon yellow, in the gardens of Messrs Pennells, Lincoln. The Grayling (*E. semele*) was noted as fairly common on Scotton Common by Mr. James Mason and Mr. E. Sewards on August 9th and August 16th.

Among the records of moths the following are the most noteworthy :—Mr. A. Roebuck records six larvae of the Large Elephant Hawk (*C. elpenor*) on August 27th at Thorganby Hall, and a larva of the Death's Head Hawk moth (*A. atropos*) at Anderby on September 26th. Miss E. J. Gibbons noted the Broad Bordered Bee Hawk (*M. fuciformis*) at Holton-le-Moor on July 5th, and the Small Elephant Hawk (*C. porcellus*) on June 26th. The Convolvulus Hawk (*S. convolvuli*) was seen at Boston, 30th September, by Mr. S. J. Hurst.

There was an unusual occurrence of the Lappet Moht (*L. quercifolia*) in the Lincoln district during July. Larvae were seen at Branston (Mr. W. Moore), and an imago brought into the Lincoln Museum July 20th. The Small Yellow Underwing (*H. tenebrata*) was common in Twyford Forest and on the High Dyke, Grantham, during the first week in June.

Considerable interest has been taken in recent years in the migration of insects and the following observations relating to our own County are worth recording.

Silver Y Moth (*P. gamma*). "On August 23rd and 24th I spent some time watching groups of these moths coming in from off the sea at Theddlethorpe and Mablethorpe. They

were flying in small groups and oddly close to the sand and against a fresh breeze from off the land. The flight continued at intervals to 4 p.m. from about mid-day. Later enormous numbers were seen all along the coast by several observers, continuing into September. At Skegness on 2nd September, three square yards of flower-bed had at one time 38 specimens upon the flowers". F. T. Baker.

Large White Butterfly (*P. brassicae*). "Odd specimens were noticed flying towards the land from a boat about 2½ miles from the shore (August 17th) between Mablethorpe and Chapel St. Leonards. Again from approximately the same district on August 29th, three specimens were flying together towards the shore". W. R. Withers.

The following notes relate to orders other than the lepidoptera and come from Mr. A. Roebuck. The galls of the midge (*Cecidomyia taxi*) were abundant on the yews in the churchyard at Kettlethorpe in October, and the aphis (*Macrosiphoniella campanulae*) abundant on Harebells at North Scarle August 13th.

CONCHOLOGY.

J. F. Musham.

Nothing outstanding in recent shells has been noted at our Field Meetings or by Mr. C. F. B. Shillito in the north.

The Broughton repository of old-time shells continues to yield abundantly. Two of the old sites have been tested again this year with remarkable results, one yielded 200 examples of the rare shell *Goniodiscus ruderatus*, by far the greatest number known to be taken at any one time anywhere, and a sinistral *Retinella radiatula*, an extremely rare form of this common shell, also *Retinella petronella*. "Careful scrutiny has revealed the presence of *Retinella petronella* (Charp). This species is near to *R. radiatula* (Ald.) and is quite unrecorded either in a living or fossil state from the British Isles. The abundance and excellent preservation of the *Vertigos* has enabled us to separate the shells previously referred to *Vertigo genesii* Gred into two species,

V. genesii and *V. concinna* Albr; thus confirming Mr. Oldham's conclusions on the *Vertigos* from the deposit at Wilstone, Herts. Malacological Society of London ". The number of sites investigated up to the time of writing is 29; total number of species is 78.

Our thanks are again due to Mr. A. S. Kennard and Mr. C. Oldham for verifying the shells from this deposit and to Mr. Shillito for so carefully working the available deposits.

An interesting and scarce colour form of the common black slug was submitted to me in September. It was taken at Bardney by Mr. J. Phillips. It was very large and fine, greenish-grey in colour, lateral banding brownish and indistinct, head and tentacles blue-black. It is referable to var. *fasciata* Van den Broeck, sub-var. *subdeletus* Cock; a type of colouration new to the County, being usually noted in the West and in Ireland.

BIRD MIGRATION NOTES.

N.E. Lincolnshire—March 1936 to February 1937.

Bernard A. Pye.

With the exception of two or three records which are localized, all the following observations were made between Cleethorpes and Grainthorpe Haven, on the coast and adjoining marsh.

Weather conditions during the Spring of 1936 were, for the most part, unfavourable for the observation of migratory movements on this coastline. Harsh winds from between N. and S.E. prevailed throughout April and May and though we had no severe late frosts, the season was cold and backward. Altogether the number of birds seen was decidedly below the average and some species hitherto occurring regularly on migration were not noticed at all. The visible emigration of Fieldfares on various dates between 11th March and 25th April and the "hold up" of small passerine passage migrants on 7th May were of outstanding interest. The latter movement must have been in progress on a very wide front, for it

was simultaneously recorded in Norfolk and several places in Scotland, including Fair Isle and Shetland.

Again in Autumn the volume of visible migration was not so great as usual. Noteworthy features of a rather uninteresting season were the unusual numbers of Little Stints in September, a remarkable movement of Wigeon on 2nd November, and, so far as my own observations went, the entire absence of Short-eared Owls.

March 6th. A Peregrine Falcon was seen to take a Stock Dove near Thoresby Bridge.

9th. Wind S.E. Large flocks of Knots. Several Cormorants.

11th. Wind N.N.E. Lapwings and Golden Plovers to to N.W. A flock of Fieldfares to E.

12th. Flocks of Starlings to S.E.

16th. Wind W. Two or three flocks of Lapwings to S.E. Several Pied Wagtails.

19th. Wind S.S.E. Two Wheatears.

22nd. Wind S.S.E. A male Black Redstart on the sea-bank at Cleethorpes. As I failed to detect any white on the wing, I took it to be a bird in its first year. A single Pied Wagtail to N.W.

23rd. Wind E. Numbers of Meadow Pipits here. Several fresh Kestrels. Large flocks of Curlews.

29th. Wind S.E. Two Turnstones. Five Snow Buntings,

30th. Wind S.W. Fresh. Some fresh Pied Wagtails here and stragglers to N.W. One Wheatear.

31st. Wind S.W. Three Wheatears. Four Snow Buntings.

April 6th. Wind N. A male White Wagtail and two Wheatears. Seven Cormorants. Some fresh Ringed Plovers.

7th. Wind N. Many Linnets to N.W. The White Wagtail still here. Four Snow Buntings and a Hooded Crow.

9th. Wind N. Two large flocks of Fieldfares high to E.

10th. Wind N. One flock of Fieldfares high to E.

13th. Wind N. A flock of 200 Fieldfares and another smaller lot to E.

15th. Wind N. Three Swallows. More Ringed Plovers.

20th. Wind W. Later N.N.E. A Cuckoo to N.W. Also many Linnets and Meadow Pipits. A large flock of Fieldfares to E.

23rd. Wind N.N.W. A Green Sandpiper.

25th. Wind W.S.W. About 150 Fieldfares high to E. The first Whimbrel.

26th. Wind W.S.W. Two Sand Martins and about 20 single Swallows coasting N.W. Also many Linnets. Two Common Sandpipers, two White Wagtails and several Wheatears.

28th. Wind S. Veering S.W. Many Linnets to N.W. One Willow Warbler.

May 4th. Wind E. Fresh. Some Swallows to N.W. More Waders—Whimbrel, Grey Plovers, Bar-tailed Godwits and a lot of Ringed Plovers. About 50 Wigeon and a pair of Shovelers. Two Wheatears.

5th. Wind E. A House Martin and some Swallows coasting N.W.

7th. Wind E.N.E. Extraordinary numbers of Pied Flycatchers and Common Redstarts in the hedges. Flycatchers, the majority of which were males, were the more numerous. Also many Whitethroats and Willow Warblers. Two Black Terns and two Lesser Terns. Some Swallows and a Swift to N.W.

8th. Still many Pied Flycatchers and Redstarts but numbers somewhat reduced. Several Wheatears.

10th. Wind N. Fresh. A good passage of Swallows and some Sand Martins to N.W. Only one Pied Flycatcher and one Redstart. Many waders—Oyster-catchers, Turnstones, Ringed Plovers, Dunlins and Sanderlings.

11th. Wind N.E. All the small passerines have moved on. Several House Martins with Swallows to N.W.

13th. Wind light and variable. Many Swallows and two

Cuckoos coasting N.W. Some fresh Whitethroats and many Reed Warblers. A Greenshank.

14th. A Hoopoe was shot or trapped "in mistake for a Jay" at Withcall, near Louth. I am obliged to Mr. Procter, the taxidermist at Louth, for notice of this bird and later I saw it in the possession of the owner, Mr. John T. Smith, of the Turk's Head, in that town, who kindly gave me further particulars.

19th. Wind N. Several Yellow Wagtails.

25th. Wind N.E. Many Sanderlings. Two Common or Arctic Terns. Several Cormorants still here.

30th. Wind N. The first Lapwings to N.W.

June 13th. A white Starling at Tetney.

20th. A Gannet was caught on the sands at North Cotes. Its bill appeared to be injured.

July 1st. Two Cormorants still here.

12th. A lot of young Pied Wagtails and Meadow Pipits.

15th. Two or three Common Terns and a few Curlews.

19th. Several Sandwich Terns and about 50 Common or Arctic.

21st. The birds coming back to the mud flats. Herons, Curlews, Redshanks and 50 or 60 black-breasted Dunlins. Several Common Sandpipers.

August 4th. Whimbrel from N. to S. for the past week. About 200 Lesser and several of the middle-sized Terns. Many Pied Wagtails and a Wheatear.

5th. About a dozen flocks of Sheld Duck—one pack of nearly a hundred.

11th. Two flocks of Teal. More waders, including a Greenshank and some Snipe. Several Golden Plovers.

13th. An adult Lesser Black-backed Gull. Four flocks —about 300 in all—of Common Scoters passing up the Humber.

16th. A number of Terns—Sandwich, Common, Arctic and Lesser. Many Pied Wagtails.

17th. Mallard scarce, but plenty of Teal and three Shovelers. Some fresh Wheatears.

23rd. Wind S.W. A lot of Bar-tailed Godwits and some Turnstones.

24th. Wind W. Some Willow Warblers in the hedges. A Lesser Black-backed Gull.

25th. Wind W. Many Whimbrels from N. to S. More Wheatears.

27th. Three Lesser Black-backed Gulls.

31st. Wind N.W. Two or three small flocks of Golden Plover to N.W. Some Sandwich Terns.

September 1st. Wind N.W. Light. Later S.E. Whimbrels from N. to S. Swallows to S.E. Several Whinchats, two Redstarts, a Pied Flycatcher and a Yellow Wagtail. A Little Stint and a Greenshank.

3rd. Wind S. Some Swifts and Swallows to S.E. Two Little Stints and a Spotted Redshank.

4th. Wind S.W. Some Mallard and four Wigeon. Two Little Stints.

6th. Wind W. Fresh. Swallows to S.E. Two or three hundred Lesser Terns. Hosts of small waders including a lot of Turnstones and a Curlew Sandpiper. A Velvet Scoter.

8th. Wind W. Strong. Later E. Herring Gulls from N.E. to S.W. Some fresh Teal.

9th. Wind E. Early morning fog. A strong flight of Lapwings and a few Golden Plover to N.W.

10th. Wind S.E. Odd Lapwings high to N.W. Some small birds in the bushes—a few Redstarts. Several Lesser Black-backed Gulls and a Ruff.

12th. Wind S.S.E. Swifts to S. Herring Gulls to W. Four Little Stints and two Curlew Sandpipers.

13th. Wind N. About a dozen Wheatears.

14th. Wind N.W. Some Swallows to S. Three Ruffs. One small party of waders consisted of two Curlew Sandpipers, two Little Stints, a Dunlin and a Ruff.

15th. Wind N. Many Whitethroats and some Willow Warblers in the hedges. Some fresh Song Thrushes and a Pied Flycatcher. A flock of 16 Little Stints and two Curlew Sandpipers with them.

17th. Wind E. A few Lapwings to N.W. About a dozen Little Stints, a Lesser Black-backed Gull and a Greenshank.

20th. Some Knot. Several Wheatears.

22nd. Wind light and variable. Swallows moving S.E. Odd Golden Plover from N. Three Curlew Sandpipers, a Little Stint, a Spotted Redshank, a Kingfisher, a Redstart, and a Yellow Wagtail.

27th. Wind N. Strong. A few Wigeon in the Humber. One Cormorant.

28th. Wind N.E. Gale. Cold. Two flocks of Twites, two Little Stints and two Greenland Wheatears. At 4 p.m. wind eased and Lapwings commenced travelling.

29th. Wind backed N.W. during night. Fresh. Cold. A heavy flight of Lapwings to N.W. For two hours after sunrise a continual stream and then slackened, finally stopping at noon. Developed again about 5 p.m. First migrating Rooks to N.W., also some Skylarks, Starlings and Linnets. The first Grey Geese. One Stonechat.

30th. Wind N.N.W. Strong. Again a large flight of Lapwings to N.W. Many Knot and a Corncrake.

October 1st. A stream of Lapwings to N.W. Also one flock of Rooks. A big flight of Starlings to N.W. during afternoon. One Little Stint.

2nd. Wind S.E. Still many Lapwings to N.W. Some Goldcrests in the hedges.

4th. Wind W. Many waders—Oyster-catchers, Knots, Redshanks, Dunlins, Sanderlings, Turnstones and Ringed Plovers.

5th. Wind E. Straggling flocks of Lapwings to N.W. and later a few from N. Two single Hooded Crows to N.W. and a flock of sixteen in one of the coastal fields. Some fresh Missel Thrushes and a single Redstart.

6th. Wind N. Cold. Four White-fronted Geese to S.E. The first Woodcock. A Little Grebe in one of the tidal drains.

8th. Wind E. A big migration of Starlings to N.W.

9th. Wind E. Straggling Hooded Crows and Starlings to N.W. Also a flock of seven Goldfinches. Two Swallows to S.E.

10th. Wind N.W. Light. A few Lapwings, Hooded Crows, Starlings and three Redwings to N.W.

11th. A Bittern at Saltfleetby.

12th. Wind W. Many Rooks, Hooded Crows (one flock of 60), Linnets and some Fieldfares to N W. Two flocks of Twites and three Greenland Wheatears.

13th. Wind N.N.W. Rooks, Jackdaws, Starlings, Skylarks and Linnets to N.W. A few Stock Doves from E. Some Rock Pipits, a Grey Wagtail a Merlin and a Stonechat.

14th. Wind S.W. Several Wheatears—one or two Greenlanders.

16th. Wind W. Fresh. Some Woodpigeons to N.W. Many Herring Gulls E. to W.

17th. Wind S.W. Gale. Mr. Foster Stubbs saw a Hen Harrier in Thoresby Fen.

19th. Wind W. veering N.W. Large flocks of Redwings from E. A single House Martin from E. to W. A flock of Scoters passing up the Humber. Two Greenland Wheatears.

20th. Wind N.W. Strong. Some of the usual species to N.W. Many Song Thrushes, Blackbirds, Missel Thrushes and Redwings in the hedges. Also some Goldcrests and Wrens. Some fresh Grey Plovers. A lot of Snipe and several Jack Snipe.

21st. Wind W. Two House Martins E. to W.

22nd. Wind W. Some Snow Buntings.

24th. Wind W. Freshening. Many Starlings to N.W. in early morning. Large migration of Rooks at 11 a.m. Gale at noon.

25th. Wind W. Strong. A few of the usual species to N.W. A lot of Meadow Pipits here.

26th. Gale from W. Rooks to N.W. despite the gale Also some Fieldfares and Redwings.

27th. Wind W. Gale continued. Rooks and Starlings

still battling on. The hedges full of Song Thrushes, Blackbirds, Missel Thrushes and Redwings held up by gale.

28th. Sharp W. Wind. Gale eased. Practically no migration. A Peregrine Falcon moving all the Knot and Lapwings into the sky. A Merlin and a Kingfisher. A large flock of Fieldfares from E. at sunset.

29th. Gale subsided. Sharp frost. Five large flocks of Grey Geese to S. At Cleethorpes I saw a Woodcock come in straight from the sea—due E. Also hundreds of Skylarks from E. Later Wind S. veering S.W. A heavy flight of Lapwings, Rooks, Starlings, Skylarks, Redwings and Linnets to N.W.

30th. Wind S.W. Warmer. A huge flight of Lapwings, Rooks, and Starlings to N.W. for the first two hours after sunrise and then slackened.

November 2nd. Wind N. cold. Rain in wind at 8 a.m. Many Lapwings, Rooks, Starlings and Skylarks to N.W. Between 7-30 and 9-30 a.m. the largest migration of ducks I have ever seen. From 100 to 120 large flocks of Wigeon and about 30 flocks of Mallard to N.W. The Wigeon (often 100 in a flock) were coming in from the Humber Mouth and following the course of the estuary but many of the Mallard were passing over the land. A lot of Snow Buntings and huge flocks of Knots.

3rd. Wind W. Some of the usual species to N.W. Many Rock Pipits, a Merlin and a Kingfisher.

4th. Wind S.S.W. Many Rooks and Lapwings high to N.W. A large flock of Grey Geese—about 300—to S.E.

5th. Wind S.S.W. Two large flocks of Grey Geese.

11th. Wind W. Cold. About 600 Grey Geese to S.

12th. Wind S. backing E. Some Fieldfares from E. An Arctic Skua feeding on a dead Gull at North Cotes sea-bank.

14th. Wind S.W. A few Fieldfares from E. A Woodcock.

17th. Wind S.E. veering W. Herring Gulls to W.

Two Kingfishers, a Little Grebe, many Rock Pipits and some fresh Teal.

20th to 27th. Fog. Unusual numbers of Grey Geese in the marsh. Two White-fronted.

30th. Wind W. Fresh. Large flocks of Lapwings to N.W.

Woodpigeons were coming in on many days during December.

On the 14th and 15th several flocks of Snow Buntings from N. and on the 23rd some Fieldfares and Redwings to N.W.

On the 30th I saw a Bean Goose in a Game Dealer's Shop at Louth, which had been killed in the district. Snipe and Golden Plover were numerous throughout the month.

On the 2nd January a drake Goldeneye and on the 13th swarms of Fieldfares from N.E.

On the 20th a lot of Golden Plover from N. and following heavy rain during night many Fieldfares, Snow Buntings, Woodpigeons and Golden Plover from N. on the 21st.

Two Cormorants on the 25th, and Mr. J. Leake saw a Little Gull at North Cotes on the 27th.

A terrific gale from E. with frost and blizzards of fine snow on the 28th and 29th brought many interesting birds. Several large flocks of Brent Geese appeared. Many additional Mallard, Sheld Duck and Wigeon and some Tufted Duck and Goldeneyes.

An exhausted Little Auk was picked up at Cleethorpes and I saw another dead along with several "shipwrecked" Guillemots, on the tide mark.

Grebes were well represented and remained for some weeks where unmolested. A Slavonian Grebe was found dead beneath telegraph wires at North Cotes, and another appeared on a small Cleethorpes Brick Pit.

Two Red-necked Grebes and two Little Grebes on the Cleethorpes Boating Lake and a further Red-necked was shot at Tetney Haven on 4th February.

A Black-throated Diver was obtained at Fulstow Brick Pits on 31st January.

On 1st February a Hen-Harrier was seen in Tetney Marsh and an albino Starling shot near Tetney Lock.

A Peregrine Falcon in Tetney Marsh on 5th February and a Red-breasted Merganser at Marshchapel on the 6th.

On the 10th a flock of Scaups and some Bar-tailed Godwits.

On the 22nd, three or four hundred fresh Curlews and three Kingfishers.

Mr. F. Stubbs shot a Shag at Tetney Haven on the 23rd, and another was obtained at Grainthorpe Haven the same day.

A Red-breasted Merganser on the 24th and another Shag dead at high-water mark on the 25th.

Mr. J. Leake saw a Hen-Harrier at his plover decoy at the Nabs, North Cotes on 25th February.

In conclusion, I have to again thank Mr. J. H. Stubbs for many interesting notes.

THE HOME LIFE OF THE SPARROW-HAWK.

S. A. Cox.

Few people have a good word for the Sparrow-Hawk. The gamekeeper and farmer accuse it of stealing their chicks, and shoot it on sight whenever an opportunity presents itself. Perhaps that is why, ever since my school-days, I have had a great affection for this pariah of the bird-world, and for that matter, birds of prey in general. Personally I do not believe that it is nearly such a nefarious character as is generally made out, and think that a lot of the casualties might be put down to the account of another marauder, the Carrion Crow. As a consequence, except for a short time in the nesting season, the Sparrow-Hawk is one of the most shy and retiring of birds. Living in the midst of a game-preserving district, it is perhaps not surprising that many years elapsed before I succeeded in locating my first nest. Since that time I have seen many more—the year 1932 alone yielded sixteen—and now

realise that it is in the well-timbered portions of the county, where little preservation is attempted, that the Sparrow-Hawk is most numerous. I well remember that first nest, and none found since has given me quite the same thrill.

It was June 10th and I was rambling through a wood composed chiefly of oak and hawthorn, with a dense undergrowth of bramble briars and rosebay, the latter not yet in bloom. A Garden Warbler had been disturbed from a bramble patch, and I was searching for its nest, when I happened to glance upwards, just in time to catch a glimpse of the shadowy form of a Sparrow-Hawk, as it dropped silently out of a tall hawthorn on my right, and glided swiftly away. In the upper branches was a huge, untidy nest. Immediately I abandoned the pursuit of the Garden Warbler and began to ascend the tree. With most species a new nest is readily detected, but in the case of the Sparrow-Hawk greater care is needed, for it looks much the same whether it is new or five years old. After a time, however, one is able to distinguish an occupied nest by the accumulation of down which is moulted by the sitting bird, fragments of which are as a rule readily visible from below.

On peering over the side I saw, to my great delight, two eggs, white in colour, faintly tinged with blue, and splashed round the larger ends with rich chocolate coloured blotches. They were about the size of a bantam's egg, and only occupied a small hollow in the centre of the huge nest, which had originally been the property of a Carrion Crow. Unlike the Kestrel, whose nest I had found annually for seven years before this, the Sparrow-Hawk builds its own nest, but it is not averse to an old, dis-used structure for a foundation. In this case the base consisted of large sticks, and the sheep's wool lining of the Carrion Crow's nest was dangling from the side. Young Sparrow-Hawks, in common with most birds of prey, are covered with thick down on the day they are born, and therefore do not require a cosy nursery like young Carrion Crows and other perching birds. A large platform of thorns and sticks had been built round the original structure, and the

nest now measured about two and a half feet in diameter. A lining of fir twigs and bark had been added in place of the sheep's wool. A number of pieces of string, the kind used for binding sheaves of corn, had also been introduced into the lining of the nest, together with a large rabbit bone and a short length of insulated wire. The whole affair was rough and untidy, but very substantial, and was about twenty-five feet from the ground. Since that time nests have been noted in a great variety of trees, ranging in height from ten to sixty feet.

The wood in which it was situated was fairly dense, but I had scarcely expected to find a Sparrow-Hawk nesting in such a locality, since there were neither spruce firs nor larches, its favourite nesting trees, and it was less than a hundred yards from a much-used public highway. Still it was hoped that it would survive sufficiently long for some photographic records to be obtained, and with this object in view I was abroad and on my way to the Sparrow-Hawk's nest shortly after dawn on the morrow, complete with camera, for I had no wish to attract the attention of the keeper of the wood, who I assumed would still be abed for some time to come.

The Sparrow-Hawk flew away quietly as soon as I appeared on the scene, and was immediately chased by a pair of Carrion Crows. On climbing to the nest I found that one more egg had been laid since my previous visit. I endeavoured to photograph the nest and its contents, but on account of the dense canopy of thorns in the vicinity the procedure was decidedly uncomfortable, and finally had to be abandoned, at any rate for the present. I was still afraid the nest would be discovered, either by the keeper or by bird-nesting boys, so word was sent that day to Mr. R. May, now well known to members of the L.N.U., advising him to come early. He came over on the same evening, and saw his first Sparrow-Hawk's nest.

The nest was again visited on the following evening, June 12th, and although the bird was not seen, the eggs were quite warm, showing that she had been brooding them recently.

There were still three eggs, for, as was afterwards discovered, the Sparrow-Hawk only lays an egg on each alternate day.

The following morning, June 13th, was damp and drizzling with rain, but I was abroad and on my way to the haunt of the Sparrow-Hawk soon after daybreak. On account of the wetness the hawk sat more closely than on previous occasions, and the climb was begun before she flew off. She had laid one more egg and seemed very anxious to return, so the vicinity of the nest was left as soon as the usual inspection had been made.

Rain fell continuously throughout the whole of the following day, and I was therefore unable to pay my customary visit.

The next day, June 15th, dawned fine and bright, so I rose early and wended my way to the hawk's nest. She saw me when still some thirty yards away and glided quietly out of sight. The ascent to the nest was now becoming well-worn. Various obstacles had been removed during earlier climbs, and it was now almost as easy as going upstairs to bed. Another egg had been laid, making five altogether. Some were almost devoid of markings, whilst others were splashed with rich chocolate.

On June 16th another early morning visit was paid, and the sitting bird allowed me to approach within fifteen yards before she left the nest.

I realised on the occasion of my next visit that she had begun to sit in earnest, for although the trunk of the nesting-tree was rapped loudly she refused to leave until the climb was started. There were still five eggs, and during the time I remained in the tree she flew round excitedly, making a curious clucking note.

Thinking that it might perhaps be wiser not to disturb the Sparrow-Hawk too frequently, I gave her three days' grace, and when next visited she repeated her previous performance all the time I remained near the nest. When she flew off she was mobbed by Starlings and Blackbirds, but paid little attention to them.

Two days later she left the nest quietly when I was still

some distance away, and made no fuss whatever. This sudden change in her behaviour rather surprised me, for on previous occasions she had never hesitated to give her candid opinion in Sparrow-Hawk language of myself and human beings in general. It was noticed on this occasion that the nest contained a few breast feathers, which had been moulted by the sitting bird.

When the next customary visit was paid on June 24th it was noticed that the tip of the hawk's tail just protruded over the side of the nest, otherwise she was quite invisible from below, and it was not until I was halfway up to the nest that she flew off. As usual she glided round in circles and chittered continuously, so I left the vicinity as soon as possible, not wishing to keep her away for an undue length of time. The quantity of feathers had increased since my previous visit.

On the morning of June 27th the Sparrow-Hawk sat tightly until I had almost climbed to the nest, and when she finally glided off, protested vigorously. The eggs were now almost buried in feathers. Up to this time no signs whatever of the male Sparrow-Hawk had been seen in the vicinity of the nest, though I had little doubt that he brought food to his mate.

When I called upon her on June 30th it was evident from her behaviour that the female Sparrow-Hawk was not in the least afraid of me. On the contrary her conduct showed quite plainly that she had not the slightest desire to be friendly. The tree-trunk was rapped vigorously as usual to let her know I had arrived, though there is little doubt that she was aware of my presence long before the nesting-tree was reached. As she did not leave her eggs the climb was commenced, and when, as the nest was approached, nothing happened, I began to wonder whether anything could have gone amiss. My fears proved to be quite groundless. Suddenly, when within six feet of her, the bird put her head over the side of the nest in my direction and chittered defiantly. Her great yellow irides flashed, and I paused for a moment, wondering whether she was about to attack, and pulled my hat brim well over my

eyes. As nothing untoward happened I continued my upward journey, and she left the eggs very reluctantly, just as I drew level with the nest. I did not stay in the tree any longer than was necessary that morning.

It was four days later when I again visited her, and as usual she left very unwillingly.

She was sitting very closely on July 7th, and had now been incubating for three weeks. I wondered how much longer she would continue to sit. She was very demonstrative, and flew round and chittered all the time I was near the nest, which now contained an abundance of feathers.

Five days later when she was visited again she was still sitting.

The next visit to the Sparrow-Hawk was on the morning of July 16th, and she seemed even more disinclined than usual to leave her charges. The reason was soon discovered. Inside the nest reposed three tiny chicks, clad in greyish-white down, together with one egg just hatching. The fifth egg was still unhatched. The male Sparrow-Hawk was also seen for the first time, and both parents flew around me with angry cries. The period of incubation had been about thirty-three days.

On visiting the nest three days later I found that all the eggs had been hatched.

The three young hawks which had hatched first were much larger and better nourished than their younger brethren, and it was evident that the two smaller chicks would not stand much chance of survival. On July 21st, I found that one of them, probably the last hatched, was dead, either from lack of attention, or from being trampled upon by his brothers and sisters. The parent bird was brooding as usual, and after leaving the nest perched in full view on a dead branch nearby, and chittered in her usual manner. There was no sign of any food at the nest.

Two days later the young chicks were growing rapidly, and had developed a faint chirrup. The hen was brooding them and displayed her usual anxiety so long as I remained

near the nesting-tree.

On July 25th the other tiny chick died from some unknown cause, and the body was removed. The other three were growing quite nicely, and the parent, who was brooding, expressed her usual show of hostility towards me.

On the morning of July 28th the parent hawk was not at the nest, but she was evidently keeping a sharp look-out for trespassers, and began chittering just before the foot of the tree was reached. The young were rapidly filling the nest, and I could see now why the Sparrow-Hawk finds it necessary to build a rim of sticks round the original structure. The young repeated the same chittering note which their parents made, but it was very subdued and feeble, and only sounded like a whispered echo. I have in later years observed the same behaviour in young Hobbies.

Three days afterwards the wing and tail feathers of the young Sparrow-Hawks began to appear through the greyish-white down. The parent bird was in the vicinity of the nest as usual, but was not brooding. There were no signs of any food at the nest.

On the morrow, August 1st, it was decided to try once again for some Sparrow-Hawk photographs. The morning was, unfortunately, overcast and very uninviting, and although I took my equipment, it was not possible to focus satisfactorily, owing to the poor light and I had eventually to abandon the idea. The young hawks were very fierce, and reared themselves on their hind quarters and opened their mouths while the camera was manipulated.

Still undismayed I went to the nest again on August 4th, and this time succeeded in making two exposures. Both parent birds were in the vicinity of the nest. Alas, upon development I found that both photographs were badly out of focus.

Next day, in company with Mr. R. May, some further exposures were made, this time bringing the young hawks down to the ground for the purpose. On examining the nest we found the remains of a hen House Sparrow, the first sign

of any food that had been seen at the nest. Our attempts to get a really first-class photograph of the young Sparrow-Hawks seemed doomed to failure, for on development we found that all our efforts were under-exposed.

Three days later the scene of our recent activities was again visited, and for the first time neither of the parent birds was seen. I therefore took advantage of the opportunity and made a closer inspection of the young hawks, which were perching on the sides of the nest, and were therefore plainly visible from below. Two of them were feathering rapidly, and had the under parts barred with chocolate. The other was not quite so far advanced, and was still downy beneath. The eye-rims and the skin at the base of the bill were bright yellow; the strong, hooked beak was slate-coloured. They were all very fierce, and gobbled like turkey-cocks to show their resentment at being handled. The remains of a small perching bird, most probably another House Sparrow, were found in the nest.

Realising that the young would not be in the nest much longer, for they were now rapidly losing their down, a further visit was paid on the following day, August 9th. Neither of the parents was in the neighbourhood of the nest, so it was concluded that they did not brood the young during the day and only visited the nest with food at intervals. Now that the young were old enough to look after themselves it was noticed that the parents became shy and suspicious again, and always kept at a discreet distance when I was at the nest.

On August 11th the three young hawks were perched on the nest as usual, a fact which was observed long before I reached the tree. Immediately the two larger ones saw me, they spread their wings and flew into the adjoining trees, each in opposite directions. Considering that this was presumably their first trip into the outer world, they fared remarkably well. The other fledging remained on the nest, and I noticed that he had recently dined, for there were fresh blood and flesh on his beak. On the nest were the remnants of his meal, as usual, a House Sparrow, probably procured from the neighbouring farm. He was perched on the edge of the nest, and

could be seen from a great distance, so I again climbed the tree and moved him to the middle of the nest, where, after a display of temper, he consented to remain, at any rate for the time being.

On August 14th I again visited the nest of the Sparrow-Hawk, and was gratified to hear the now-familiar call of the young hawks as I began to climb. The two elder ones left the nest almost immediately, one after the other, and flew into the adjoining trees, as on the occasion of my last visit. Just as I drew level with the nest the third fledgling decided to follow his brethren into the outer world. Before he could be stopped he was over the side of the nest and had launched himself into mid-air. Not being very strong, he merely succeeded in gliding down, something after the style of a parachute, into a bramble patch, where he sat looking very dejected, but quite unhurt. I extricated him and buttoned him inside my waistcoat for safety, after which we began the return journey to the nest. He did not seem in the least grateful for my assistance, and stuck his talons very tenaciously into my chest during the ascent. In the nest were the remains of a cock House Sparrow. On this occasion again neither of the parent birds were seen.

I decided to make one last desperate effort to secure a photograph of the remaining fledgling, and on the following evening took my photographic apparatus to the home of the Sparrow-Hawk. After setting the camera on its stand it was focussed on a convenient gate-post. On this it was intended to place the young Sparrow-Hawk, if and when he was caught, for I fully anticipated a lively scramble before he was captured. In this respect I was not disappointed. Glancing upward at the nesting-tree the two elder birds were seen perching on the branches outside the nest, but Hector, as I had fondly christened the youngest, in spite of his scratches, waited until the nest was reached Thereupon he dived rather than flew into a neighbouring blackthorn bush, from which I succeeded in rescuing him. He was then placed upon the gatepost, where he became unexpectedly quite passive and posed very oblig-

ingly, and a successful exposure was secured. Afterwards I placed him inside my waistcoat once again and returned him to the nest, and in the course of transit he expressed his farewell greetings by sticking his talons once again into my shirt front. He was now quite as strong and agile as his brethren, and it was evident from his behaviour that he would not be likely to remain much longer in the nest. On leaving I glanced backwards and saw that he was following my departure with his keen, flashing eyes. That was the last I saw of Hector.

Next evening, August 16th, the nest was empty, apart from the half-devoured remains of a small bird. As I was leaving one of the young hawks was heard calling in a thicker part of the wood, but as it was getting dusk I did not endeavour to locate it.

During the next week or so I was unable to visit the copse where I had spent so much of my leisure time during the previous three months, but when I did so on August 26th the Sparrow-Hawks were soon located by their cat-like call, a a plaintive, long-drawn, mewing note, but they were not seen, as they were now rapidly becoming as wary and suspicious as their parents. The undergrowth was also very rank and wet, and I had eventually to abandon the pursuit.

On several occasions during the next few weeks I heard the young Sparrow-Hawks calling whenever I was in the vicinity of the wood in which they were reared. I had had them under almost constant observation for eleven weeks. During that time I had climbed to the nest no fewer than thirty-six times and had learned a great deal about the home-life of a most interesting bird.

Unlike the Kestrel, the Sparrow-Hawk rarely occupies a nest a second time, but the nest already described was the exception, and was again in use two years later. Unfortunately, for no apparent reason, the bird deserted, and during that season no brood was reared.

In the fourth year the old Sparrow-Hawk's nest was tenanted by a most unexpected occupant. When I visited it on May 12th of that year a Moorhen was incubating eight eggs. The nearest water was fully two hundred yards away, nevertheless it was lined with decaying aquatic weeds in the usual manner. My wife and I were fortunate enough to be present when the seven chicks left the nest a fortnight later, one egg having proved infertile.

BIRD NOTES.

ARCTIC TERN. A specimen of this bird was picked up dead on August 4th at Glentworth by Mr. Charles Cross. It was a ringed bird and we are informed by Mr. H. F. Witherby, to whom the ring was referred, that it was ringed at the Farne Islands on 30th June 1936.

SNIPE. Mr. A. Benton of Billinghay, when cutting his seeds in July with a grass cutter, cut over a snipe's nest with five eggs. In spite of the cutting the Snipe continued to sit and in two days three of the eggs hatched. The young ones remained in the nest for three days when they made off.

CAPT. W. A. CRAGG.

OSPREY. The Brocklesby lakes attract many interesting birds, but, accustomed as we are to pleasant surprises, we were quite unprepared to encounter an *Osprey* on a fine June morning. It stayed unmolested for three days, and was seen several times to take pike from the lake at Lambert Hill.

S. A. Cox.

BUFF-BACKED HERON. A strange bird was reported at North Killingholme in October, perching on the backs of cattle. Enquiries elicited the fact that the bird had been seen about the Humber marshes since early September, and was well-known to the employees of the Barton and Immingham Light Railway. It was seen by the members of the British Empire Naturalists' Association on October 25th and 26th, and was satisfactorily identified as a *Buff-backed Heron*—a rare visitor to these parts. Unfortunately it took its departure on October 29th, and the members of the L.N.U. who assembled at North Killingholme on November 1st were disappointed. There seems a doubt as to whether the bird was a true vagrant, as several Buff-backed Herons were released from Whipsnade about a year ago.

S. A. Cox.

REVIEWS.

"British Grasshoppers and their Allies", by Malcolm Burr, D.Sc., F.R.E.S.; 162 pp., with 6 plates, 40 maps and 56 drawings in the text. (Philip Allan and Co., Ltd., 69 Great Russell Street, London, 6s. net.)

The intention of this work is to encourage the study of a much-neglected group of insects. Dr. Burr presents in a very interesting manner the present state of our knowledge of the cockroaches, crickets and grasshoppers. A study of the maps shows how little is known even of the distribution of many species, and the work should be the means of stimulating interest in this order among naturalists. In Lincolnshire much remains to be done and naturalists would do well to follow Dr. Burr's instructions relating to practical field work.

F. T. B.

"Songs of Wild Birds", by E. M. Nicholson and Ludwig Koch; 216 pp., with illustrations and accompanied by two double-sided gramophone records of birds' songs. (H. F. & G. Witherby, Ltd., High Holborn, London. 15s. net.)

This further addition to Messrs. Witherby's series of Bird-Lovers' Manuals is a most outstanding production. Not only is the book well written and full of original information, but it has the advantage of illustration by means of excellently recorded songs of wild birds in their natural haunts. This has overcome many of the beginner's difficulties in identification of bird-song. The work should be added to the library of every naturalist and bird-lover and must be regarded as a standard work of reference. F. T. B.

"Bird Migration", by A. Landsborough Thomson, C.B., D.Sc.; 224 pp., with illustrations. (H. F. & G. Witherby, Ltd., High Holborn, London. 5s. net.)

Another volume in the same series as the above work. This intensely interesting subject is dealt with in a skilful manner and the many aspects of recent research are included. The great problems of bird migration receive attention and the accompanying maps and diagrams greatly add to its value. It is an indispensable book on the subject. F. T. B.

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